86th YEAR

AMERICAN GAS JOURNAL

AUGUST 1945

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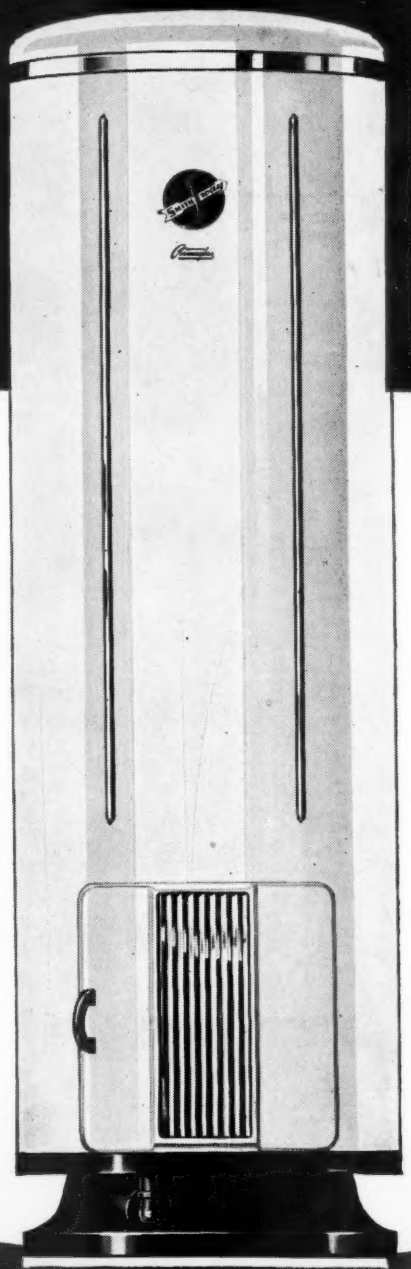

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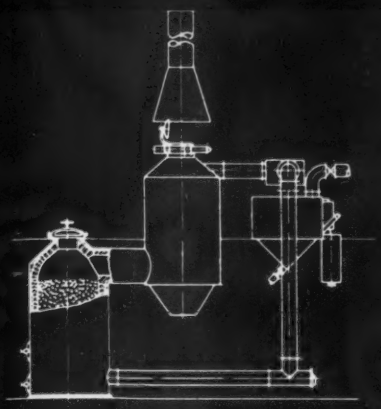

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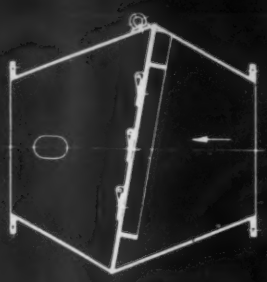

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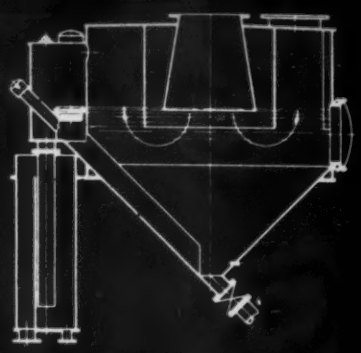

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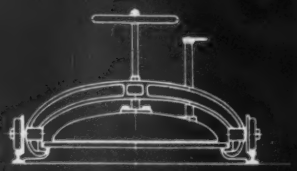
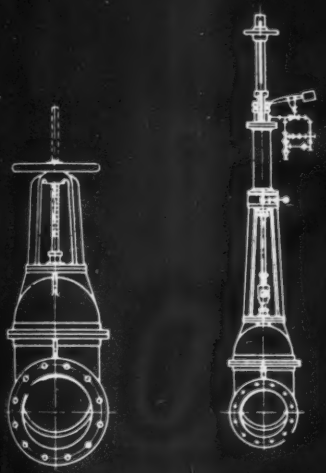
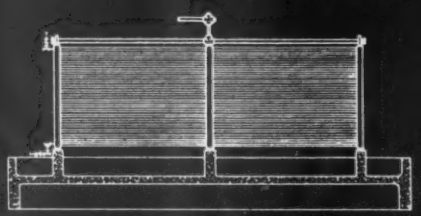


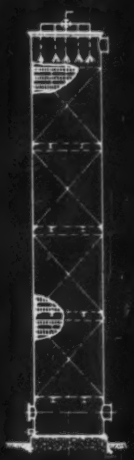
CHARGING DOOR



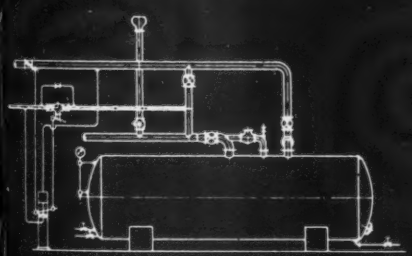
HAND OPER. HYDR. OPER.
GATE VALVES



COOLING COIL



GAS SCRUBBER



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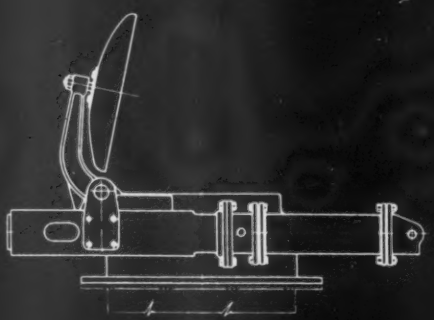
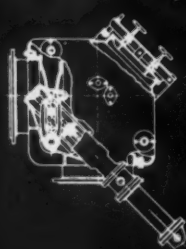
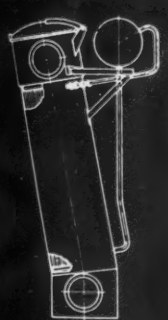


HYDRAULIC OPER.
STACK VALVE



HYDRAULIC OPER.
REVERSING VALVE



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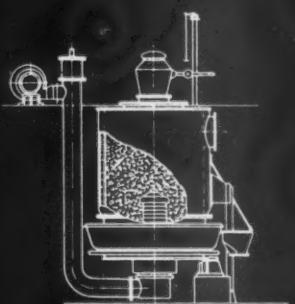

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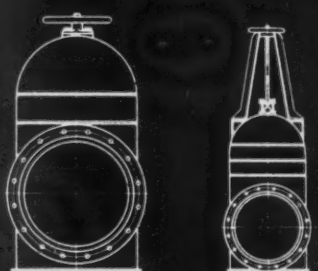
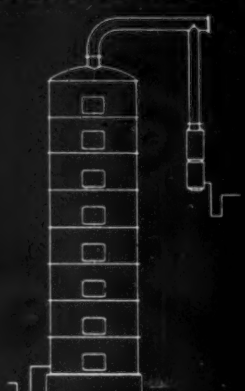


BLAST GATES



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Features of the Servel Unified Gas Kitchen will insure a performance, in a comfort-conditioned environment, of unusual convenience, reflecting a new public concept of the modernity of domestic gas service in the Kitchen.

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For detailed information on Servel Unified Gas Kitchens, write Advertising and Sales Promotion Department, Servel, Inc., Evansville 20, Indiana.

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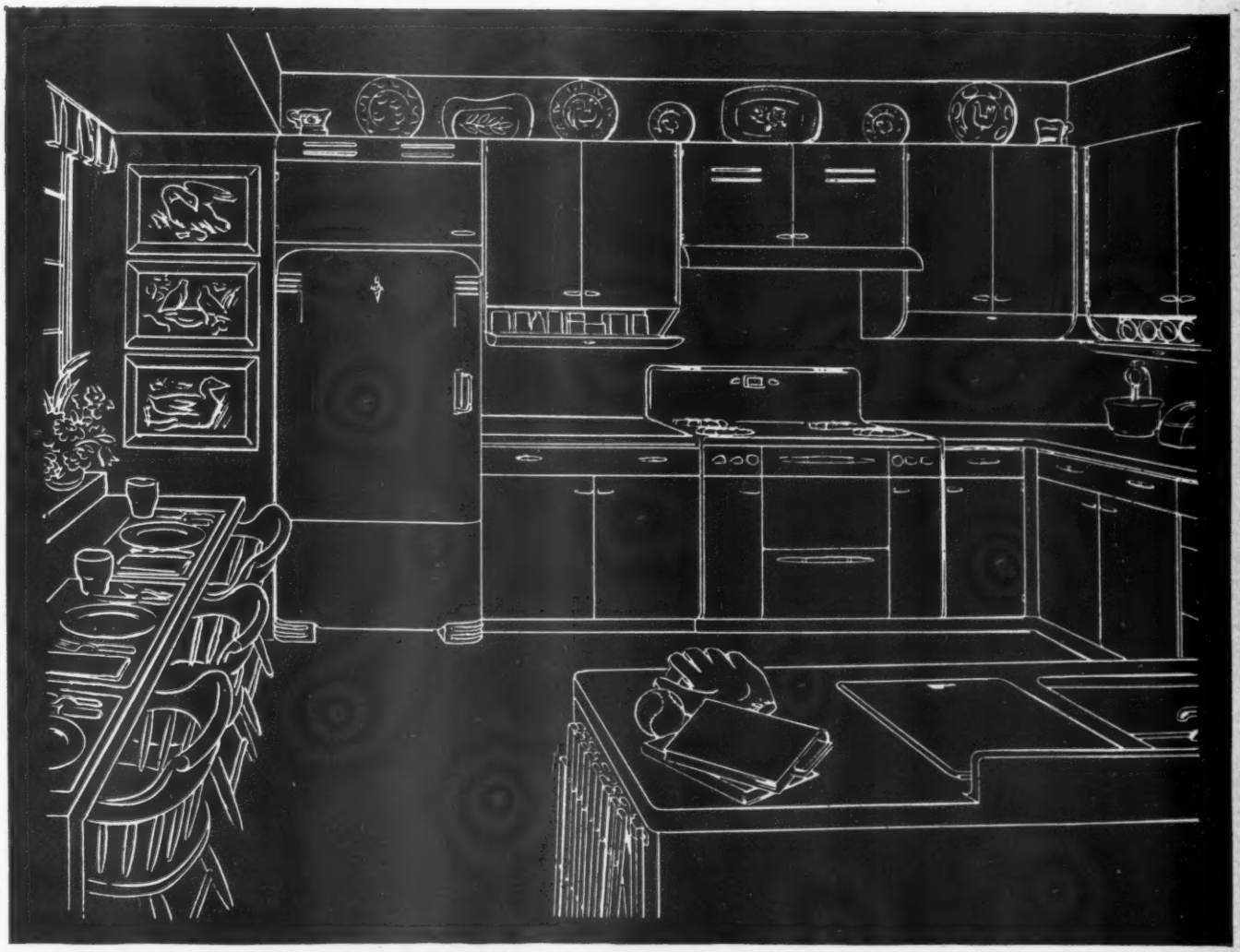
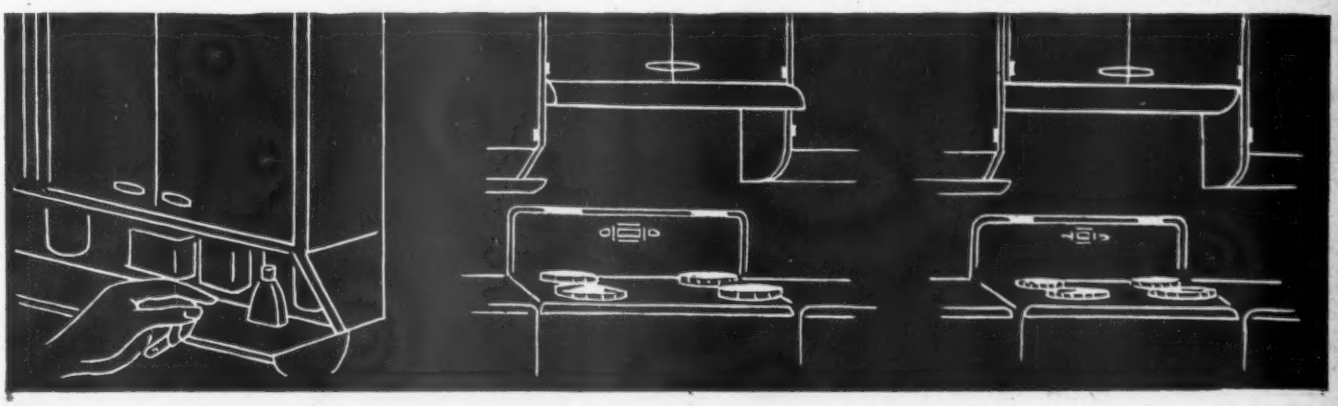
New Freedom Gas Kitchens Designed by Servel



Work area location of exclusive storage features provides a new convenience in the Servel comfort-conditioned kitchen. Pull-up cabinet cowl over the range (shown open and closed) automatically provides air circulation for the removal of greasy vapors, moisture and cooking odors.



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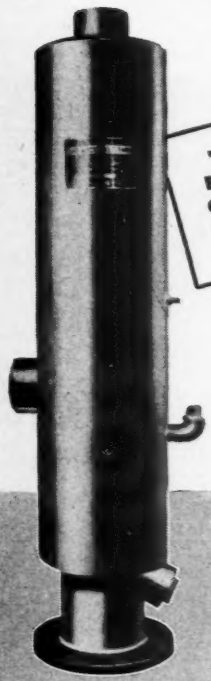

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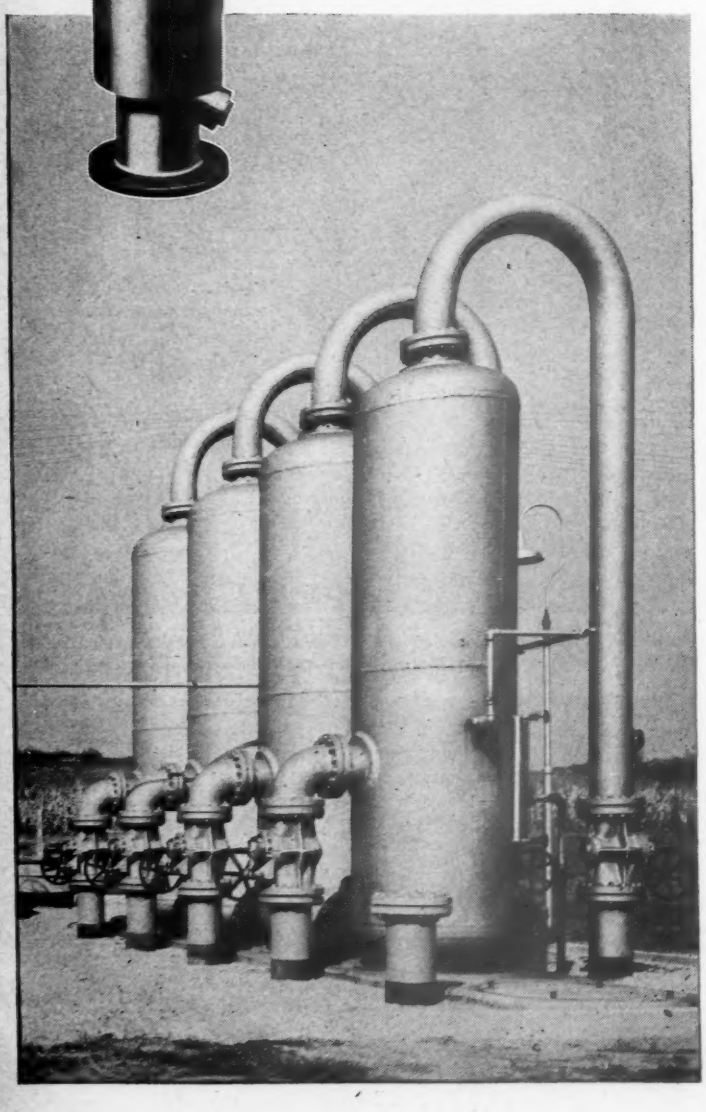

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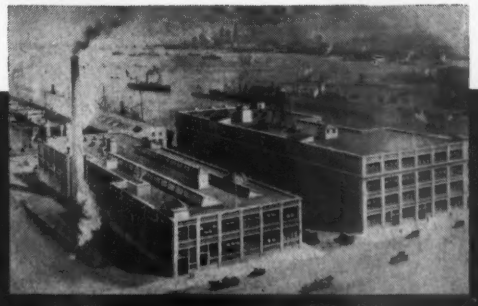

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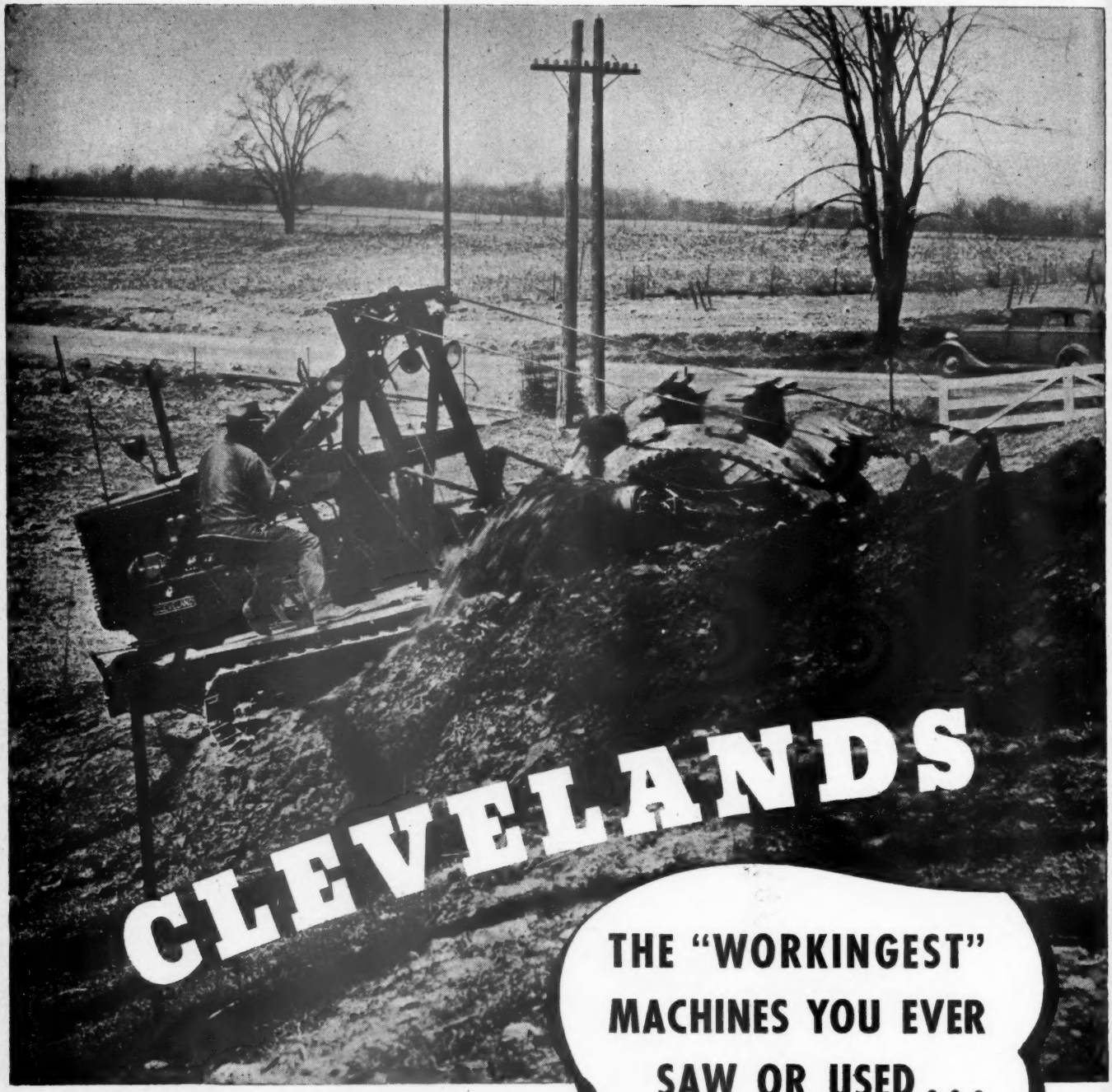

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VOLUME 163
NUMBER 2

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AUGUST 1945

AMERICAN GAS JOURNAL

VOLUME 163 No. 2

Utilization of Liquid Petroleum Gases Replacing Manufactured Gas

By E. G. Boyer,
Manager, Gas Department
Philadelphia Electric Co.

Edward G. Boyer

DURING the past few years, the use of liquid petroleum gases has come to the fore as a very practical means of supplying the required additional load.

The Philadelphia Electric Company is faced with this problem of meeting increased demands and it has done some study work on the best means of meeting these demands. We have had no practical experience as yet in the actual distribution of liquid petroleum vapors. Our only experience with interchanging a high B.t.u. and specific gravity gas for one of lower B.t.u. has been in the utilization of refinery oil gas for underfiring the coke oven battery at our Chester plant in place of coke oven gas.

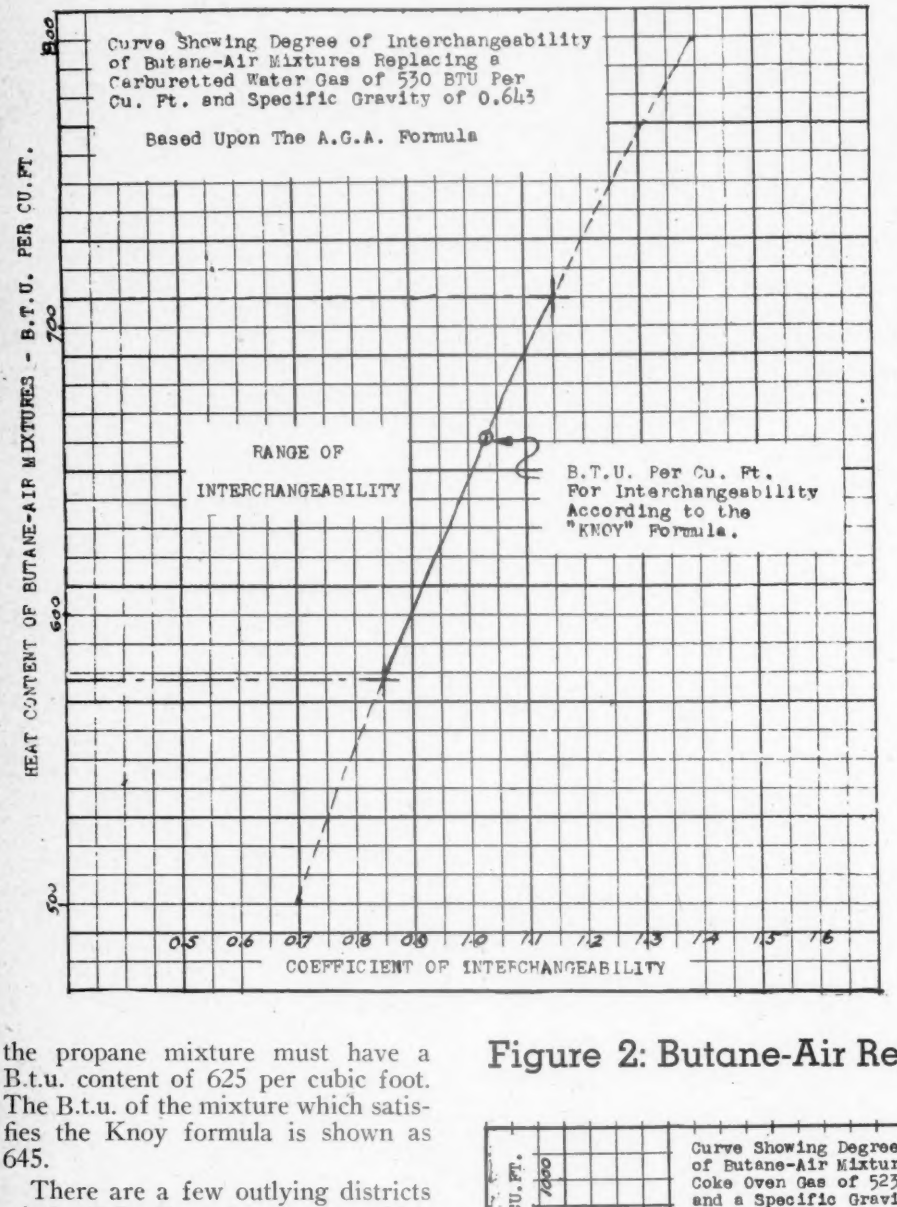
Much theoretical work has been done by the American Gas Association and by men in the gas industry to find a means of estimating or calculating the properties which one gas must have in order to replace another gas. The American Gas Association has developed a formula, which is much used in the industry, and is a very good guide. This formula takes into account the theoretical air requirements for combustion, the heating value of the gas, the specific gravity and the ignition and burning characteristics. When the various values for the replacing gas and for the gas to be replaced are substituted in this formula, the answer obtained is called a "coefficient of interchangeability," or "index of change in performance of the appliances." This formula has been tested under many combinations of gases and it has been found that a gas which, when compared with the gas to be replaced, gives a coefficient of interchangeability of 1.0, performance will be satisfactory in the appliances. It has been found that a reasonable amount of leeway above and below this 1.0 is permissible and American Gas Association has set the limits of satisfactory performance between 0.85 and 1.15.

Mr. Knoy of the Long Beach Municipal Gas Department, Long Beach, California, in a paper entitled, "Combustion Experiments with Liquid Petroleum Gases" developed an empirical formula for control of mixtures of liquid petroleum gas and air to replace other gases. This formula is comparatively simple and relates merely the heating value of the gas and the specific gravity. When values for these are substituted in the formula, the answer is a constant for any gas. When this constant is obtained for the gas which is to be replaced, any other gas, whose relation between its heating value and specific gravity equals that some constant, will give satisfactory performance in the appliances. The use of these formulas can be demonstrated by the accompanying curves.

Figure 1 is a curve showing the degree of interchangeability of butane-air mixtures of various heat content and specific gravity with carburetted water gas of 530 B.t.u. per cubic foot and a specific gravity of 0.643. The curve is based on the A.G.A. formula and it shows that butane-air mixtures between 580 B.t.u.'s per cubic foot and 710 B.t.u.'s per cubic foot should work satisfactorily in the appliances adjusted for the carburetted water gas. At a coefficient of interchangeability of 1.0, the B.t.u. of the butane-air mixture will be 650. Also shown on the curve is the point which satisfies the Knoy formula of interchangeability and is shown at 660 B.t.u.

In like manner, Figure 3 shows the degree of interchangeability of propane-air mixtures of various B.t.u. content and specific gravity with carburetted water gas of 530 B.t.u. per cubic foot and specific gravity of 0.643. In this case the range of interchangeability, according to the A.G.A. formula, is between 560 and 680 B.t.u. per cubic foot, and at a coefficient of interchangeability of 1.0,

Figure 1: Butane-Air Replacing Carburetted Water Gas



the propane mixture must have a B.t.u. content of 625 per cubic foot. The B.t.u. of the mixture which satisfies the Knoy formula is shown as 645.

There are a few outlying districts of the P.E. Company system which are fed by long distances of 4-inch and 6-inch mains. To get gas to these areas on peak days taxes the transmission system and causes high pressures to be carried at the main plants in order to supply these outlying districts. Liquid petroleum-air plants at these points might be well worth while to relieve the burden on the transmission system. The normal gas supplied to these districts varies in specific gravity from about 0.400 to about 0.550. The worst condition of interchangeability would occur with the lightest gas, a coke oven gas of about 0.400 specific gravity.

Figure 2 shows the degree of interchangeability of butane-air mixtures of various B.t.u. and specific gravity replacing coke oven gas of 523 B.t.u. per cubic foot and specific gravity of 0.402. This curve shows that a butane-air mixture with a B.t.u. content between 760 and 930 will give satisfactory performance in customers' appliances. The point which satisfies the Knoy formula is shown as 785 B.t.u.'s per cubic foot. At a coefficient of interchangeability of 1.0, the butane-air mixture should be 850.

In like manner, propane-air replacing coke oven gas is shown in Figure 4, and shows a range of 735 to 880 B.t.u. per cubic foot. At a coefficient of interchangeability of 1.0 the propane-air mixture should be about 800 B.t.u.'s per cubic foot. The point which satisfies the Knoy formula of interchangeability is shown to be 765 B.t.u.'s.

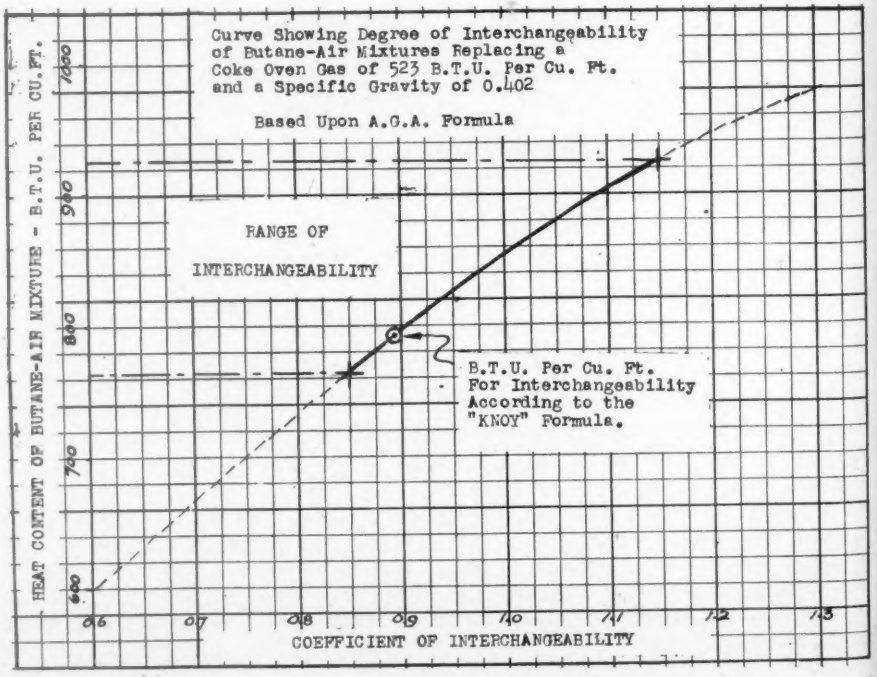
These figures show how closely the two formulas agree.

Various methods of utilizing liquid petroleum gases are as follows:

1. Complete Replacement of the Original Gas.

This method is shown by the Figures 1 to 4 just described and shows that a much higher B.t.u. gas must be distributed to operate satisfactorily in the appliances. For peak operation I see no particular reason against the higher B.t.u. being used. True, the customer will get a few more B.t.u.'s than the rate calls for, but for economy of operation and an over-all satisfactory performance, I believe that it can be used.

Figure 2: Butane-Air Replacing Coke Oven Gas



2. Distributing the liquid petroleum-air mixture at the same B.t.u. as the original gas.

In this case, if the original gas is coke oven gas of 520 B.t.u. as in our system, or carburetted water gas of say 530 B.t.u., liquid petroleum-air mixtures of the same B.t.u. content will not interchange 100 percent satisfactorily. Figures 1 to 4 show this, that 520 and 530 B.t.u. are far below the lower allowable limit of good interchangeability. Under this lower limit the mixture will back fire and be very noisy, and give accompanying troubles. The proportion of LP gas-air mixture that can be used satisfactorily will have to be determined by calculation, by adding various proportions of LP gas to the original gas analysis and using the formula until the mixture is found which gives a coefficient of interchangeability within the allowed limits. The American Gas Association, in its report No. 645, shows maximum allowable combinations of liquid petroleum-air mixtures and original gas. For example, this report, in Table No. 12, shows that the percent of butane-air mixture allowed in the total sendout with carburetted water gas is 15 percent.

The table also shows that only 10 percent of butane-air mixture is allowed in a total sendout mixed with coke oven gas.

3. Pressure increases in the distribution system.

The formulas just referred to give the interchangeability of gases at the same pressure as that at which the original gas was distributed. If it is desired to distribute the replacing gas at the same B.t.u. content as the original gas, it will be necessary to increase the line pressure.

The flow of gas through an orifice varies inversely as the square root of the specific gravity and directly as the square root of the pressure. Figure 5 shows the pressure relation according to this rule for various B.t.u. content and specific gravity of various butane-air and propane-air mixtures when replacing carburetted water gas and coke oven gas.

For instance, Curve No. 1 shows that if it is desired to distribute 520 B.t.u. mixture of butane-air for carburetted water gas, the line pressure must be raised to 1.8 times what it was for the distribution of the carburetted water gas; that is, if the distribution pressure for carburetted water gas was five inches, the pressure for the butane-air mixture at 520 B.t.u. would have to be nine

Figure 3: Propane-Air Replacing Carburetted Water Gas

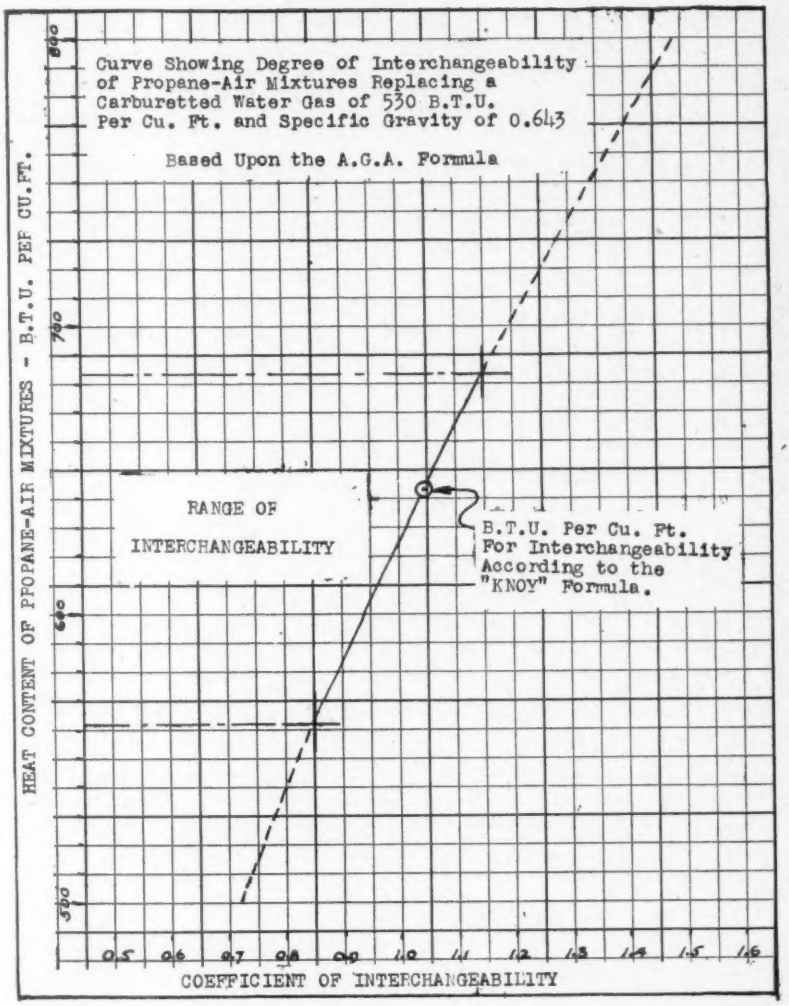

Curve Showing Degree of Interchangeability of Propane-Air Mixtures Replacing a Carburetted Water Gas of 530 B.T.U. Per Cu. Ft. and Specific Gravity of 0.643
Based Upon the A.G.A. Formula
RANGE OF INTERCHANGEABILITY
B.T.U. Per Cu. Ft. For Interchangeability According to the "KNOY" Formula.
HEAT CONTENT OF PROPANE-AIR MIXTURES - B.T.U. PER CU.FT.
COEFFICIENT OF INTERCHANGEABILITY

Figure 4: Propane-Air Replacing Coke Oven Gas

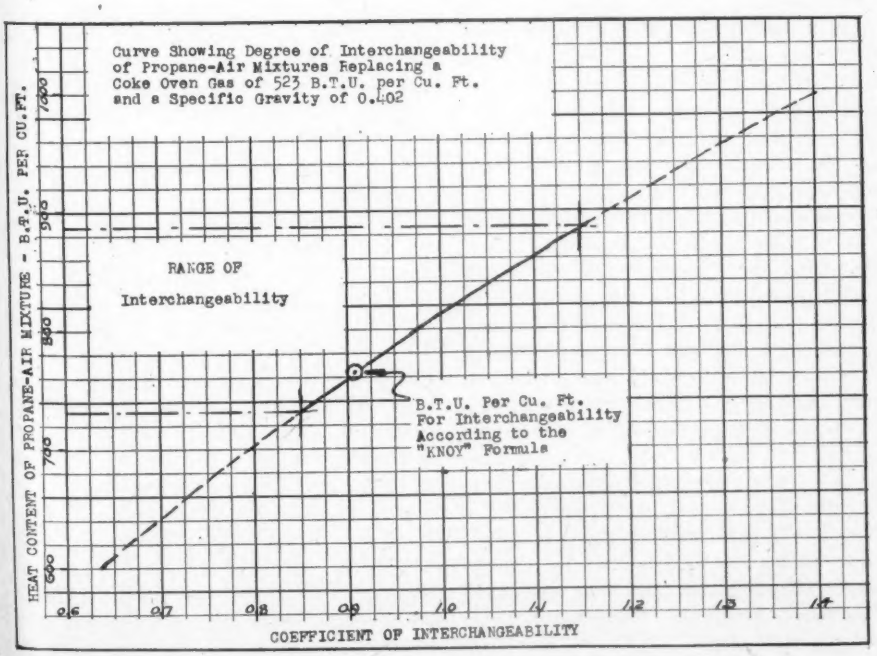
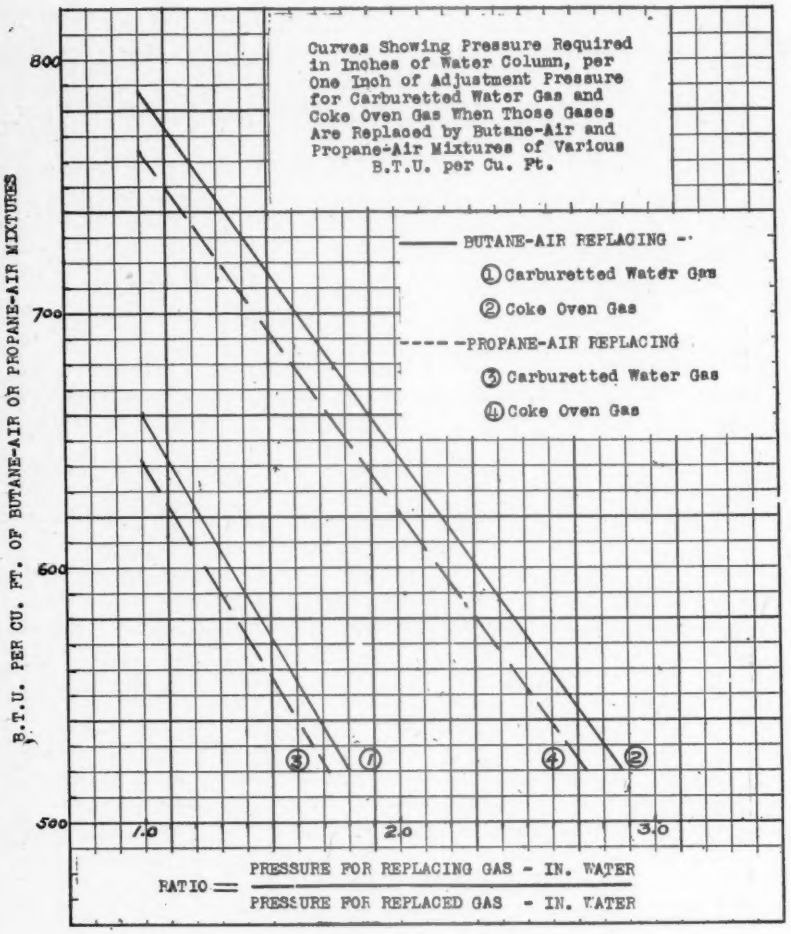

Curve Showing Degree of Interchangeability of Propane-Air Mixtures Replacing a Coke Oven Gas of 523 B.T.U. per Cu. Ft. and a Specific Gravity of 0.402
RANGE OF Interchangeability
B.T.U. Per Cu. Ft. For Interchangeability According to the "KNOY" Formula
HEAT CONTENT OF PROPANE-AIR MIXTURE - B.T.U. PER CU.FT.
COEFFICIENT OF INTERCHANGEABILITY

Figure 5: Pressure Ratio Curves


Curves Showing Pressure Required in Inches of Water Column, per One Inch of Adjustment Pressure for Carburetted Water Gas and Coke Oven Gas When Those Gases Are Replaced by Butane-Air and Propane-Air Mixtures of Various B.T.U. per Cu. Ft.
BUTANE-AIR REPLACING
① Carburetted Water Gas
② Coke Oven Gas
PROPANE-AIR REPLACING
③ Carburetted Water Gas
④ Coke Oven Gas
B.T.U. PER CU. FT. OF BUTANE-AIR OR PROPANE-AIR MIXTURES
800
700
600
500
1.0
2.0
3.0
RATIO = PRESSURE FOR REPLACING GAS - IN. WATER / PRESSURE FOR REPLACED GAS - IN. WATER

inches. The top end of this curve shows that at the same distribution pressure the butane-air mixture must be 660 B.t.u. The other curves are on the same basis and it is seen that when butane-air of 520 B.t.u.'s replaces coke oven gas of 520 B.t.u.'s, the line pressure must be increased to 2.9 times the pressure at which the coke oven gas was distributed. Between the upper and lower limits of these curves are various combinations of B.t.u. content and pressure ratios which should give satisfactory performance in the appliances.

Of course, the foregoing has been a theoretical discussion of what can be expected. None of the formulas claims to be exact, but is merely a guide for a starting point and when the starting point has been decided upon, then tests must be run to be sure that that which has been decided is the correct conclusion; or through the tests, find out the changes that must be made in order to give the best performance. As mentioned previously, Philadelphia Electric Company has had no actual experience in the distribution of liquid petroleum gases, but it has had experience in using the refinery oil gas in place of coke oven gas for underfiring its coke oven battery at Chester. A description of the problems encountered and the decisions reached was given in a paper before the American Gas Association, Technical Section Meeting at the convention in 1943. In this case it was found that a 740 B.t.u. refinery oil gas-air mixture replaced a 560 B.t.u. coke oven gas. Figure 6 is the Knoy formula applied to this interchange on the battery at Chester.

At the time the battery was built it was not quite sure what the B.t.u. would be in the oven gas, or what would be the B.t.u. of the gas-air mixture in the primary fuel gas tube. For this reason the curves A and B were plotted, believing that actual results would be somewhere between the two curves.

Curve A shows the line for the B.t.u.'s and corresponding specific gravities that will interchange with a coke oven gas of 530 B.t.u.'s per cubic foot and a B.t.u. of the primary mixture in the fuel gas tube of 350.

Line B shows the B.t.u.'s and corresponding specific gravities for gases to interchange with a coke oven gas of 560 B.t.u.'s per cubic foot and a B.t.u. of the primary mixture in the fuel gas tube of 200. At the time the underfiring was contemplated, these two curves were drawn because it was not known exactly what the operating experience would be, or what would be the best heat value for the primary mixture in the fuel gas tube to the battery.

Practical experience showed that a heat value of 296 B.t.u.'s in the primary mixture in the fuel gas tube gave the best underfiring results.

Line D shows the B.t.u. and corresponding specific gravity of the gases which will interchange with a 560 B.t.u. coke oven gas and with 296 B.t.u.'s in the primary mixture.

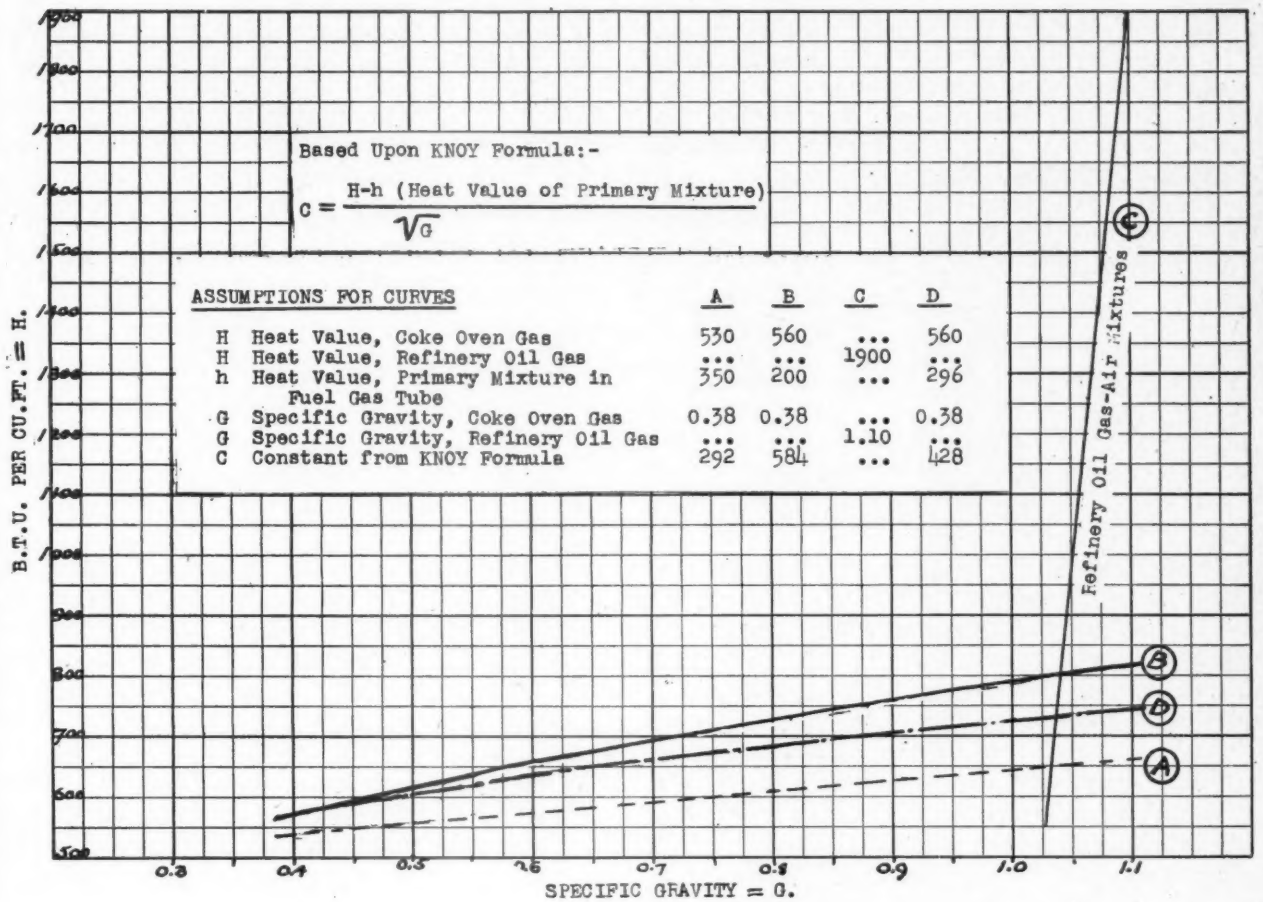
Line C shows the B.t.u. per cubic foot and the corresponding specific gravity when a refinery oil gas of 1,900 B.t.u.'s per cubic foot is mixed with various proportions of air. This line crosses Curves A and B at the points shown and the B.t.u. represented by the crossing point shows the conditions for satisfactory interchangeability of the refinery oil gas air mixture for the coke oven gas.

It is seen that the refinery oil gas-air mixture Line C crosses the "actual experience" Line D at 730 B.t.u. per cubic foot, which is almost exactly the 740 B.t.u. which we are using for underfiring the battery.

I believe that this instance proves the reliability of these formulas as guides to actual interchange of different gases. Our experience at our Coke Oven Plant shows that petroleum gas of high B.t.u. and specific gravity can be interchanged with another entirely different gas quite readily if the conditions are met. We are so connected at the plant that coke oven gas can be put into the burner header in place of the refinery oil gas, and the refinery oil gas can be put back into the header in place of the coke oven gas as we desire, without any change in the burner orifices.

Because of the assumptions made in the development of the A.G.A. formula, it is not recommended for use with gases in which the ratio of free hydrogen to inerts is less than 1.0. The Knoy formula disregards chemical composition of the gases and utilizes only B.t.u. and specific gravity. Inasmuch as the two formulas agree very closely, I believe that for basic calculations prior to interchanging gases, the A.G.A. formula can be applied without concern about the ratio of free hydrogen to inerts. For this reason I have used the A.G.A. formula on propane and butane, as shown in Figures 1 to 4,

Figure 6: Refinery Oil Gas-Air Replacing Coke Oven Gas for Under-firing Coke Ovens Chester, Pa.


Based Upon KNOY Formula:-
C = H-h (Heat Value of Primary Mixture) / √G
ASSUMPTIONS FOR CURVES
A B C D
H Heat Value, Coke Oven Gas 530 560 ... 560
H Heat Value, Refinery Oil Gas ... ... 1900 ...
h Heat Value, Primary Mixture in Fuel Gas Tube 350 200 ... 296
G Specific Gravity, Coke Oven Gas 0.38 0.38 ... 0.38
G Specific Gravity, Refinery Oil Gas ... ... 1.10 ...
C Constant from KNOY Formula 292 584 ... 428
B.T.U. PER CU.FT. = H.
SPECIFIC GRAVITY = G.
Refinery Oil Gas-Air Mixtures
C
B
D
A

in which the hydrogen-inert ratio is zero.

This is borne out, too, in our experience in P. E. Company. For instance, the refinery oil gas arrives at our plant with a free hydrogen-inert ratio of about 1.5. After being diluted with air, and waste gases from recirculation in the battery's burner flues, that ratio is reduced to almost zero. Yet our experience shows this gas is readily interchangeable with the coke oven gas. Another example is our distribution of gas from Chester at 520 B.t.u. per cubic foot and a specific gravity of around 0.68 to 0.70. Our analyses show that in the past years the free hydrogen-inert ratio has varied from 0.70 to 1.8. This ratio depends upon the mixing of reformed oil gas, coke oven gas, blow run gas and straight refinery oil gas. This gas has given very satisfactory performance over a wide specific gravity range of, say, from 0.54 to 0.70. I believe that if we chose to do it, we could increase the B.t.u.'s per cubic foot sent out and make this "heavy" gas readily interchangeable with the "lighter" gas distributed to about half of our territory where appliances are set for about an 0.40 to 0.45 specific gravity.

We feel that the reason for our success in interchanging high gravity reformed refinery oil gas with low gravity coke oven gas with very little difficulty with the existing appliance adjustments lies in the burning characteristics of our reformed refinery oil gas.

Difficulty is experienced in interchanging directly, coke oven gas and carburetted water gas. Because of its higher specific gravity the carburetted water gas flows more slowly from the burner of the appliance than does coke oven gas, which results in a tendency toward a shorter flame; the carburetted water gas contains about 70 percent of carbon monoxide and hydrogen which are relatively fast burning gases. The slow moving yet fast burning carburetted water gas increases the tendency toward a short flame with flash backs and noise, since the gas does not flow from the burner fast enough to compensate for the rapid rate of flame propagation of the carbon monoxide and hydrogen. Reformed refinery oil gas of about the same specific gravity as carburetted water gas, however, will interchange fairly successfully with the coke oven gas. This is because the reformed refinery oil gas contains only about 35 per cent of the fast burning carbon monoxide and hydrogen, the remainder of the gas consisting of slow burning hydrocarbons and blow run gas, including inerts. The reformed oil gas flows from the burner at about the same speed as the carburetted water gas since it has about the same specific gravity, but, since it burns more slowly than the carburetted water gas there is less tendency toward a short flame and the gas will burn satisfactorily.

It is not often that increased pres sure can be accomplished readily and economically. The most logical place to use increased pressure is in a territory that is supplied by district regulators so that if it is necessary to increase pressure maybe one or two or so district regulators can be set out in pressure to supply many customers. In a territory that is served by house regulators, this, of course, cannot be easily done because it is almost a practical impossibility to go to each

customer's house and reset the regulators for a short peak, and then when the system returns to normal, to revisit the houses and reset the house regulators again. It would seem, therefore, that the best operation would be to increase the B.t.u. and the specific gravity of the gas to a point where the peak gas will interchange readily with the normal gas distribution.

In areas fed by small high pressure mains it would be a comparatively simple matter to erect butane or propane storage plants, with necessary vaporization equipment and controls, to feed into the main system automatically when the line pressure reaches a certain predetermined minimum. In the P.E. Co. we have a number of HP tank storage plants for our own gas in outlying districts, which feed into the mains when the pressure drops to a certain minimum. It takes our own gas to refill these tanks on off peaks. However, since our production capacity is being taxed to its near limit, these tank storage plants could be converted to butane-air or propane-air plants for peak use which would have the effect of increasing our net gas production capacity and allow our own gas to be used elsewhere in the system at times when it would be most needed. In addition, it would take a pumping load from the compressors at the critical time of peak pumping.

A few companies have kept the same heating value after changing over, but a change over of this kind usually requires the overhaul of all gas appliances and the changing of many burners. The best B.t.u. value for propane-air service or butane-air service depends upon the type of appliance in your territory, the gas pressure now used, and the composition of the present gas. When the work has progressed, it is advisable to make up mixtures of the various replacing gas for tests with the kind of appliances in use in your area. The amount of propane-air and butane-air which can be added to the given gas supplied will be influenced by the heating value, specific gravity, and the length of time during which the substitute gas is to be used. I repeat again that no hard-and-fast rule can be set down, but each territory must be examined for itself by applying the various formulas and using them as tools, as it were, for guidance for the best results.

In conclusion, it seems almost unnecessary to point out that the degree of usefulness that the processes and operations I have discussed will possess for you gentlemen, will have to be determined by each company by means of an economic analysis. The comparative cost of meeting peak loads through the use of LP gases must be weighed against the use of standard apparatus, and that is a decision that each individual management must make. I would like to point this out, however. There may be revolutionary changes ahead for the gas industry; I hope there are. But if so, they are still some years in the future. We won't be making gas commercially by smashing atoms in the next few years, we'll be using the equipment and methods now available to us.

The LP gases now seem to be available in large quantities and at a reasonable price. They will find an outlet and we must decide if it is better for us that that outlet be through the gas companies rather than in competition with them. Any concerted action upon the part of the gas companies to use these gases may very well influence the oil refiners to make more of them available to us at a reasonable price. By providing cheap base gas through the reforming process, cheap peak load gas by reforming and air-mixing, and a cheap means to supply outlying sections, these gases may very well be the means to permit the gas companies to take on and supply the new loads until new and still cheaper processes become available. With a growing and flourishing gas industry working together to develop them, these new processes will be certain to come.

At the Gas Company Managers Conference of the New England Gas Association, held in Boston, June 29th, Mr. Boyer presented a two part article. One part titled "The Utilization of Hydrocarbon Gases in the Production and Distribution of Manufactured Gas," in which he outlined the experience in the Gas Department of his company over the last fifteen years, "The gas industry," Mr. Boyer states "must solve three problems,—First, it must produce gas more cheaply; second, it must provide peak production capacity with the minimum of investment per M. C. F.; and third, it must minimize the cost of distributing its gas, particularly where seasonal loads cause mains to be idle for part of the year." The paper referred to above will appear in a later issue of the Journal. Ed.

Natural Gas In the Economy of Louisiana

By
Hon. Sam H. Jones
Ex-Governor of Louisiana

NEARLY ALL of Louisiana's troubles have sprung from an economic unbalance. This condition has been common to the entire South. And the South, as an area, has at no time in its history ever achieved a balanced economy. Even in its rich and lush antebellum days it clung to a lop-sided agricultural economy which later accounted for its undoing and the plunge of its people into an era of poverty. And for these past eighty years we have been looking for the answer that will correct the condition which has designated us as the Number One Economic Problem of the nation.

We have not succeeded, as is evidenced by these facts: Our agriculture has dropped from the richest to the poorest. Our commercial exports have dropped from 80% to 21%. Our resources have been pillaged and transported to industrial areas for processing. Our incomes, wealth, bank deposits, insurance assets, and banking capital have dropped from highest place to lowest place. Our lands have been eroded; our forests denuded; our waters dissipated; our mineral deposits raped; and our fish and wild life ruthlessly destroyed. As long as these conditions continue to exist we shall continue to have more than our share of social, political and economic problems.

It is axiomatic that no section can become economically prosperous unless the incomes, the living standards and the purchasing power of its people be raised to a level comparable with the more progressive and advanced areas of the world. And it is also axiomatic that the true test of wealth is not measured in dollars and cents, but in soil, and climate and resources—and the ability to use these God-given assets to the best advantage of the people.

Thus, in the final analysis, that area is potentially rich which is blessed with fertile soils, abundant forests, supplies of water and deposits of minerals, with a climate sufficiently favorable to enable mankind with his mental and physical labor to develop these assets and resources to their greatest productivity. Louisiana has the fertile soils, the growing forests, abundant supplies of surface and underground water, together with a versatility of mineral deposits, solid, liquid and gaseous. Thus, Louisiana is potentially rich because nature has endowed it with all the prerequisites of wealth. But Louisiana is actually poor because we have not applied our intelligence and our labor to the development of the riches which nature has bestowed upon us.

There is no royal road to wealth. There is no magic wand that can be waved to convert the poor into the rich. There is only one approach to the problem—and that is the application of intelligent planning and hard work. By this method and this method alone can we salvage a heritage that has almost been snatched away from us. By this method, and this alone, can we rehabilitate our people and make of them strong and healthy, self-sustaining people.

To commence with, we must tackle the problems of the soil. We have millions of acres of the most productive lands in the world. They need the application of an intelligent drainage program and the necessary labor to do the job.

Then we must advance to the problems of the forests. They are in the hills of North Louisiana and they are in the swamps of South Louisiana. Those forests now yield us $125,000,000 a year. They can be made to yield $250,000,000 a year. But to reach this higher figure we must apply intelligent planning and hard labor. Such a program will provide more and better jobs for greater numbers of our people. New forest products industries will arise. New articles of commerce will come into being. And numerous parishes of the state, now impoverished, will once again become self-sustaining. With amazing new discoveries calling for a multiplicity of uses of woods and wood pulp, we can build a new day in the forest areas for a new generation of Louisianians.

We could stop here and still be able to compete with most areas of the world in natural wealth and natural advantages. But nature once again has outdone itself. Beneath the surface of the earth she has lavishly deposited storehouses of mineral wealth, seldom if ever equalled in diversity and extent anywhere in all the world. With unlimited supplies of salt, lavish supplies of sulphur, incredible deposits of shell and limestone, and abundant supplies of petroleum and petroleum gases, nature has given to us a combination of mineral wealth, the like of which exists nowhere else in the world. It all bespeaks the

Hon. Sam H. Jones

***Immediate past Governor of the State of Louisiana, Sam H. Jones is a leading conservative, as well as a leading authority on natural gas. In this article, Ex. Gov. Jones deals with the economics of the State of Louisiana, and especially with the part natural gas should take in improving the whole economy of the State. He states frankly why the State should develop all its natural resources for the benefit of the State.*—Ed.**

erection of a chemical-industrial empire. And nothing but crass ignorance, or systematic plundering exceeding that of the Goths and Vandals, can stop or thwart this natural heritage of our land and our people.

Therefore, getting back to our premise, which is that we shall become wealth-producing only by applying intelligence and labor to our natural assets and resources. The problems of employment cannot be solved merely by added acres of land put to mechanized agriculture. These problems cannot be solved by the growing and harvesting of trees, though the entire 16 million acres suitable to that purpose be used. These problems cannot be solved by the fullest utilization of our waterways and sea-lanes. Nor can they be solved by the mining and shipping away of our mineral wealth to other areas for manufacture and processing. These problems can only be solved by the building of industries which will take these resources and convert them into the finished product with all the increased employment and wealth that is added by manufacture.

No nation or section will ever become rich or even self-sufficient whose people continue to be hewers of wood and drawers of water. Until we commence to process the products of our farms into the finished product; until we commence to convert the products of our forests, not into crude lumber, but into all the finer products which lumber gives birth to; until we commence to take our supplies of minerals and, through the smelters of industry and the alchemy of chemistry, combine and convert them into the myriad of products which will amaze the entire civilized world—we shall not get ourselves out of the economic rut through which we have stumbled and groped for the better part of a century.

Utility Natural Gas

It is but common sense, therefore, that we should utilize our limited supplies of natural gas to the end that the most wealth may be created and the most jobs be supplied to those who are going to be searching for jobs in the post war period. If, therefore, we have the choice of marketing our natural gas at three cents a thousand cubic feet or of converting it into plastic worth, the equivalent of $3.00 a thousand cubic feet of its gas content, it shouldn't take us long to market a portion for the more profitable purpose. If we have the choice of flaring oil field gas into the sky or using it as lifting power to produce more wealth in the form of additional petroleum economics demands that we use it to recover the additional wealth. And if we have the choice of marketing our gas in distant areas and thus get only the market price for raw material, or of marketing it here at home for job-creating purposes then the answer should unhesitatingly be in favor of the latter.

Bearing in mind that our purpose in Louisiana is to correct an economic unbalance, and that this can be done only by balancing agriculture with industry, let us then seek to determine what function natural gas can play in this over-all plan to make our people self-sufficient and increase the general income, living standards and purchasing power.

An Irreplaceable Fuel

In the first place natural gas is an irreplaceable fuel, and fuel is indispensable to the development of industry. If we were blessed with other forms of fuel supply, this subject would not be so urgent. But we are not so blessed. There are three forms of potential industrial energy, namely, coal, water power and natural gas. We have not in this area a pound of coal. We have no water power, and from the nature of our flat terrain, will never be blessed with hydro-electric power. We have only the limited supplies of natural gas to which we must cling for our own industrial salvation.

Natural gas constitutes 1/10 of one per cent of our mineral fuel, while coal constitutes better than 99% of the nation's total mineral fuel. It is, therefore, ridiculous to rob ourselves of this limited supply of natural gas to send it into areas rich in coal and hydro-electricity. Putting it in another way, we have known reserves of natural gas which will be depleted in approximately 25 years at the present rate of withdrawals. Yet we are shipping approximately 50% of the withdrawals to areas blessed with 3000 years' supply of coal and unlimited supplies of water power. The most ordinary exercise of common sense would suggest that this practice is unwise and unfair to our people—and that its practice certainly should not be increased.

Economic Value of Natural Gas

In the second place, or perhaps in importance we should place it first, natural gas has a tremendous economic value in the recovery of petroleum from the underground reservoirs. For this purpose it is used in the propulsion of oil from great depths which other methods could never recover. In the early days of oil production, millions of dollars of natural wealth were left trapped and unrecovered forever because of failure to utilize scientific methods of production. Our own Conservation Department is able to give an example of two oil fields where the utilization of natural gas for repressuring resulted in the recovery of 17 million dollars of additional oil. With the end of the war, and the elimination of war-time restrictions, it may reasonably be assumed that this program will be further expanded.

In one field it is said that the ultimate recovery of oil increased 80% because of the utilization of natural gas. Natural gas is now being moved from one field to another in order to use it to produce otherwise unrecoverable reserves of oil. The amount of additional oil that can be recovered from the underground reserves by this process certainly extends into fabulous millions. We have no right to throw away forever this immense wealth. We have no right to deprive the operator, the royalty owner, the state, and the people of Louisiana of this added and needed wealth when the means exist at our elbow to save and preserve it. Our failure to use that means brings about further impoverishment of our people. And these repeated acts of omission constitute an indictment against us as a people.

Today our tax structure depends heavily upon petroleum. This is all well and good so long as it lasts. But with wasteful and extravagant methods we are hastening the day of petroleum's permanent exhaustion. If we can make oil last, and pay the bill, until we otherwise correct our economic unbalance, then the state can weather the storm. But we need to extend that life—because we are running a race which, if we lose, will create a catastrophic condition in our public finance. The foundation of our public education system, to which is dedicated the severance taxes on oil and gas, will be seriously shaken if not actually destroyed.

Natural Gas a Raw Material

In the third place, let us consider the use of natural gas as a raw material—as distinguished from a fuel. It is in this field that the greatest possibilities exist. It is in this field that this resource holds the greatest promise in correcting the economic ills of our state and our people. In the dawning day of chemical discoveries there are literally hundreds of uses and hundreds of products to be derived that will make natural gas the greatest single instrument toward the

"What woman *wills*... will be"

Today She Wants the Harper Burner System

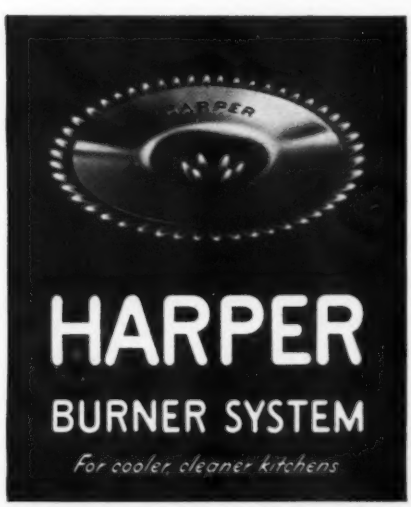
WHEN HOUSEWIVES became dissatisfied with the unsightly, unsanitary and inconvenient kitchens of yesterday . . . things happened!

And now, they have learned that there is one *best* top burner . . . a dual purpose burner that provides the complete range of heats required for frying and to *start* foods boiling, and a separate heat to *maintain* the cooking and to keep foods warm for serving. They want it!

With the Harper Burner System, each burner is actually 2 burners in 1 . . . a burner within a burner . . . both operated and controlled by a single handle. The small, inner *cooking* burner can be used entirely independently of the *starting* burner. No other top burner possesses this vital advantage, which insures easy, accurate control . . . better cooking results.

In the AGA campaign of appliance improvement and promotion to maintain and enlarge the position of gas as the ideal cooking fuel . . . the Harper Burner System is the *answer* in the top burner field.

Copr. 1945, Harper-Wyman Co.



ARMY E NAVY

On next page
WHAT USERS SAY

"LESS GUESS WORK IN COOKING"

with the HARPER BURNER SYSTEM says this user

No woman likes to spend most of her time hovering over the range while preparing a meal... and then not be *sure* of the results. You can be sure with the Harper Burner System, an advantage that appeals to Mrs. R. A. Heist Jr., 558 S. Clay St., Kirkwood, Mo., who says:

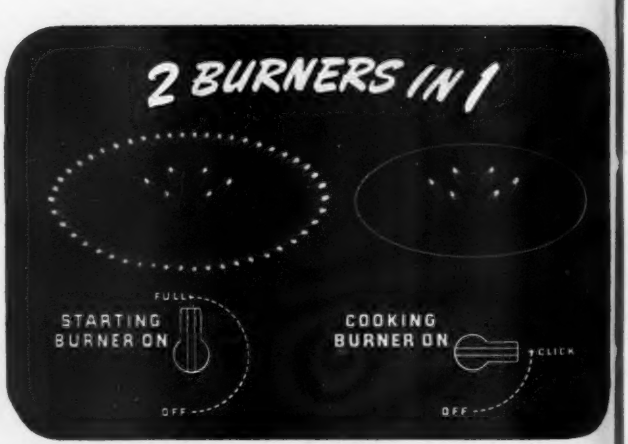
"There is less guess-work in cooking when you have the Harper Burner System. The accurate control of the small burner flame, and the fact that it can be turned lower than ordinary burners, gives this assurance."

"ABSENT COOKING" A REALITY

THE VERY FACT that the Harper Burner System permits more flexible and accurate low heat *control* than any other top burner means that *guess-work* is eliminated... thus making it unnecessary for the housewife to remain constantly on guard at the range.

No other top burner makes it so easy to gauge the exact amount of heat desired for every type of cooking. Many women estimate that they save an average of 8½ hours of unnecessary pot watching each week. "Absent cooking" can be done without worry about food boiling over or boiling dry. Just this *one* advantage of the Harper Burner System explains why the first question asked by thousands of women when buying a new range is—"Does it have Harper Burners?"

NOTE: A *new* and *improved* Harper Burner System is now available for range manufacturers who are producing deluxe ranges. Harper-Wyman Company, 8562 Vincennes Avenue, Chicago 20, Ill.



The Harper Burner System operates on the unique principle of "2 burners in 1"... a STARTING BURNER plus a small, economical COOKING BURNER, both controlled by the same handle. It is subject to finer gradations of low heats—greater control and economy—than any other top burner made.

HARPER BURNER SYSTEM

"HOLDS THE LINES FOR GAS"

HARPER BURNER SYSTEM

—One of the standards of top burner performance under cp

correction of our economy. This ought to be obvious to the people of our state. For already there are plants costing millions, using natural gas as a raw material, that would not be here but for our supplies of natural gas. These are but the forerunners of many others if we but intelligently conserve our supplies of gas. These are in fact the harbingers of a great industrial empire that will go far towards balancing our economy and putting our people on their feet, economically speaking.

By-Products

The high octane plants are here in Louisiana because of the hydro-carbons of natural gas and petroleum.

The synthetic rubber plants are here in Louisiana because nature endowed us with these same supplies of natural gas.

Anhydrous ammonia plants are here because of the supplies of natural gas.

Chemical plants producing a great variety of finished products are here because of our supplies of natural gas.

But those already here are small in proportion to the number that will locate if we insure to investors an adequate future supply.

Thus in the manufacture of acetylene from natural gas, Dr. E. P. Schoch of the University of Texas, estimates that 10 cents per thousand cubic feet can be paid at the well, and that this value can be increased forty-fold in the process of manufacturing the finished product. And he terms this estimate as conservative.

In the great and unfolding age of plastics the hydrocarbons of natural gas constitute a rich supply of the raw materials which will build great industries and give to Louisiana the economic balance it has so long been deprived of by reason of our own lack of foresight.

The utilization of natural gas in the manufacture of nitrate fertilizers is of double significance to our people. For at the same time it provides industrialization of our resources and supplies plant food needed in our lagging agriculture. No greater boon could offer itself to our people than the development of nitrate fertilizer plants that seem assured with preservation and utilization of our natural gas.

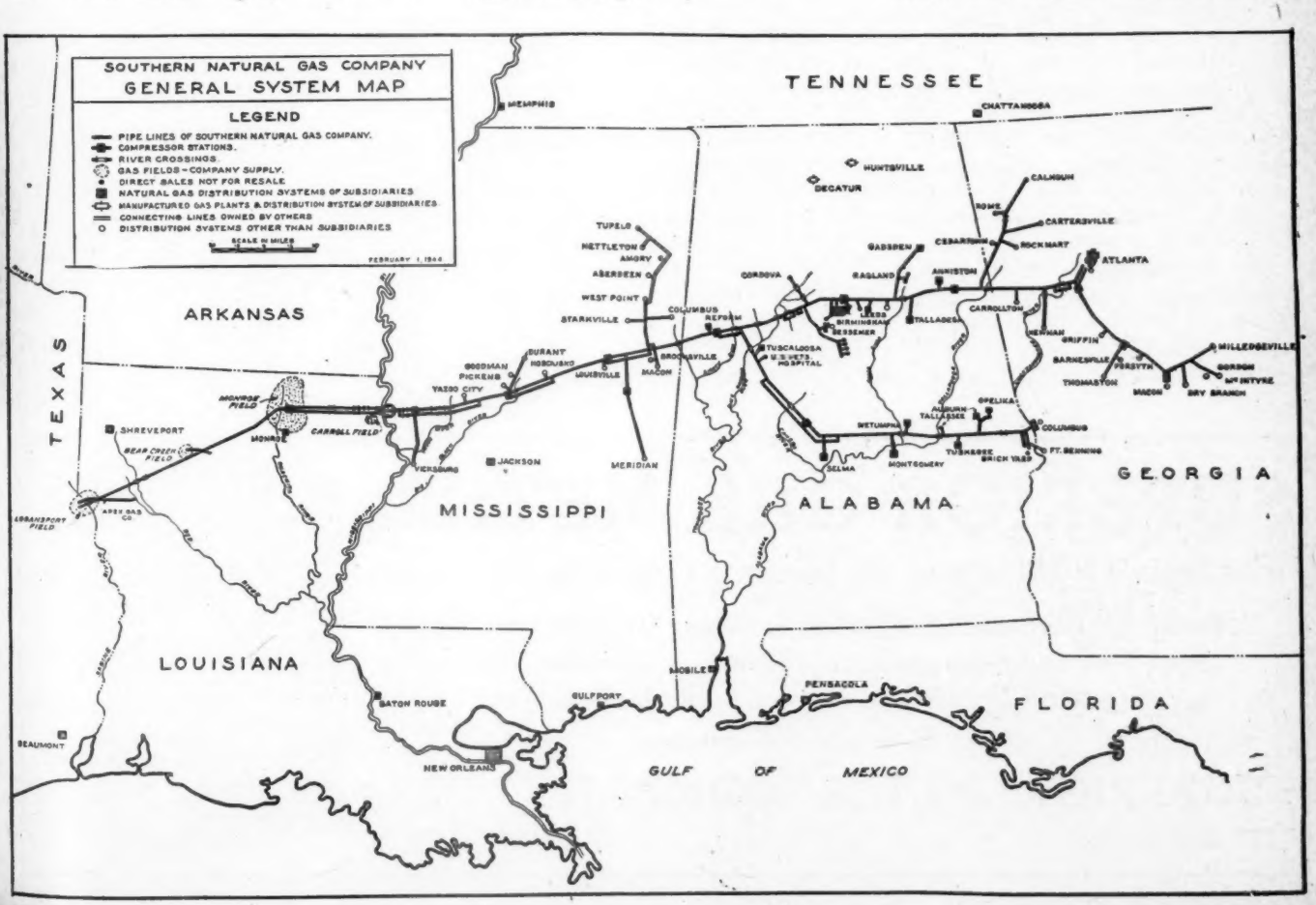
One of our larger oil refineries, operating in Louisiana, has listed as products of natural gas drugs and solvents, inks and paints, lacquers and blending agents, anti-freeze solutions, aviation gasoline, together with synthetic and butyl rubber.

The utilization of natural gas as a fuel in the field of ceramics opens up still another huge industrial opportunity. Dr. Schoch estimates that "the potential production of ceramic products in Texas should be at least $100,000,000 annually." If we can produce one-fourth that amount here in Louisiana, we would be the possessors of a new $25,000,000 industry. And the geologists tell us that we have the clays wherewith to do the job.

In this same category is the manufacture of that new indispensable, safety glass, which in itself can become an industry giving great employment to large numbers of our people.

And sound business executives in the petroleum industry tell me that it is but a matter of a few years until methane or dry gas will be a serious competitor to petroleum as a raw material for the manufacture of gasoline, so vital to the transportation system of America. And with diminishing supplies of oil, this is a significant development of great economic import.

And when finally we get into the subject of general chemistry and begin to understand the marvelous things that organic chemists can do,



This System Map indicates migration of Louisiana Gas to Mississippi, Alabama and Georgia.

and expect to do, with the various combinations of the hydrocarbons that constitute natural gas, we inevitably come to the conclusion that there is almost no limit to the commercial possibilities that this one resource offers us.

The whole picture adds up to the conclusion that we have in natural gas the source of our one great opportunity to bring about the needed industrialization of our state which, in turn, will establish a balanced economy that will be so direly needed by Louisiana and her people in the post-war days.

Conclusions

I cannot conclude without endeavoring to correct a few misapprehensions or distortions of the truth which seem to have gotten abroad.

In the first place the desire of the state government to stop the flaring and burning of gas is not a move to punish operators or to unduly restrict or impede their activities. The purpose of this effort is to save wealth for the benefit of the operators, land owners, the state and its people.

In the second place the effort to keep natural gas for our own benefit is not an unfair sectional attitude. The philosophy behind this move is not predicated on state line barriers. Nature has been a great deal wiser than men. For nature has given fairly adequate supplies of natural gas to those very areas without supplies of coal. This is true in Louisiana, Mississippi, Texas and Kansas, together with Western Oklahoma and South Arkansas. It is this entire economic area, without regard to state lines, that should be protected against the encroachments of outside interests who already have ample supplies of coal and water power.

In the third place there is no disposition on the part of the state to deprive any producer or land owner of a market for their supplies of natural gas. The contrary is true. The state desires to provide an even better and more accessible market—a market that can be reached without the expenditure of huge investments in the form of pipe lines to distant areas. These markets will in turn continue the job of wealth production for the benefit of our own people and our own section instead of adding to the wealth of other sections that are in no need thereof—on a comparative basis.

In the fourth place there is no disposition to minimize, or hold down, the price at the well. The efforts of those participating in this movement have already resulted in increasing the price at the well. Instances are known where a price of eight cents at the well has been offered and refused. And it is common knowledge that many large operators are holding their entire reserves because of their belief that more advantageous contracts will be possible for the sale of their gas in the future. Nor does this mean a higher price for domestic consumers. The best proof of this is that in the East, where much gas is used by industry, the price at the well sometimes goes as high as 20 cents, yet the domestic price is lower than in Louisiana. The addition of industry is the answer.

In the fifth place there is a conscientious desire to give a fair break to all owners of gas reserves so that in the future we will not have a condition where a few producers have all the market and the others have none. And these "others" are often subjected to drainage by the favored operators. An equitable formula, under the conservation laws of Louisiana, can, and I am confident will, be found to protect the interests of all concerned.

In the sixth place there is a mad scramble for construction of new pipe lines. Most of these come from the inexperienced. Very few comparatively come from the old established operators or from those widely experienced in petroleum and natural gas. The unrestrained granting of pipe line applications would not only be unfair to the state and its people; it would also be unfair to the industry as a whole. In this connection it should be noted with interest that most of the "fly-by-night" have not attempted of late to get into Louisiana, but have centered their efforts in the areas of Kansas, Texas and Oklahoma.

There is nothing in the program of your conservation department or of your natural gas conservation committee that is not in conformity with sound economics. There is nothing impractical in these plans and programs. There is nothing contemplated that would adversely affect any group of interests except those located in the rich coal-bearing and water power sections. Certainly there is nothing that would reduce the ultimate return to the operator and land owner. There is nothing that would adversely affect the markets available.

But there is much that would favorably affect the future of Louisiana and her people. Our wealth would be preserved and multiplied. Industries would balance our economy. Jobs would be provided for those returning from war and uprooted from farms. Greater returns would be achieved by the operators and the land owners. Greater tax returns would redound to the state. And the blessings of added wealth would be spread to every family of Louisiana.

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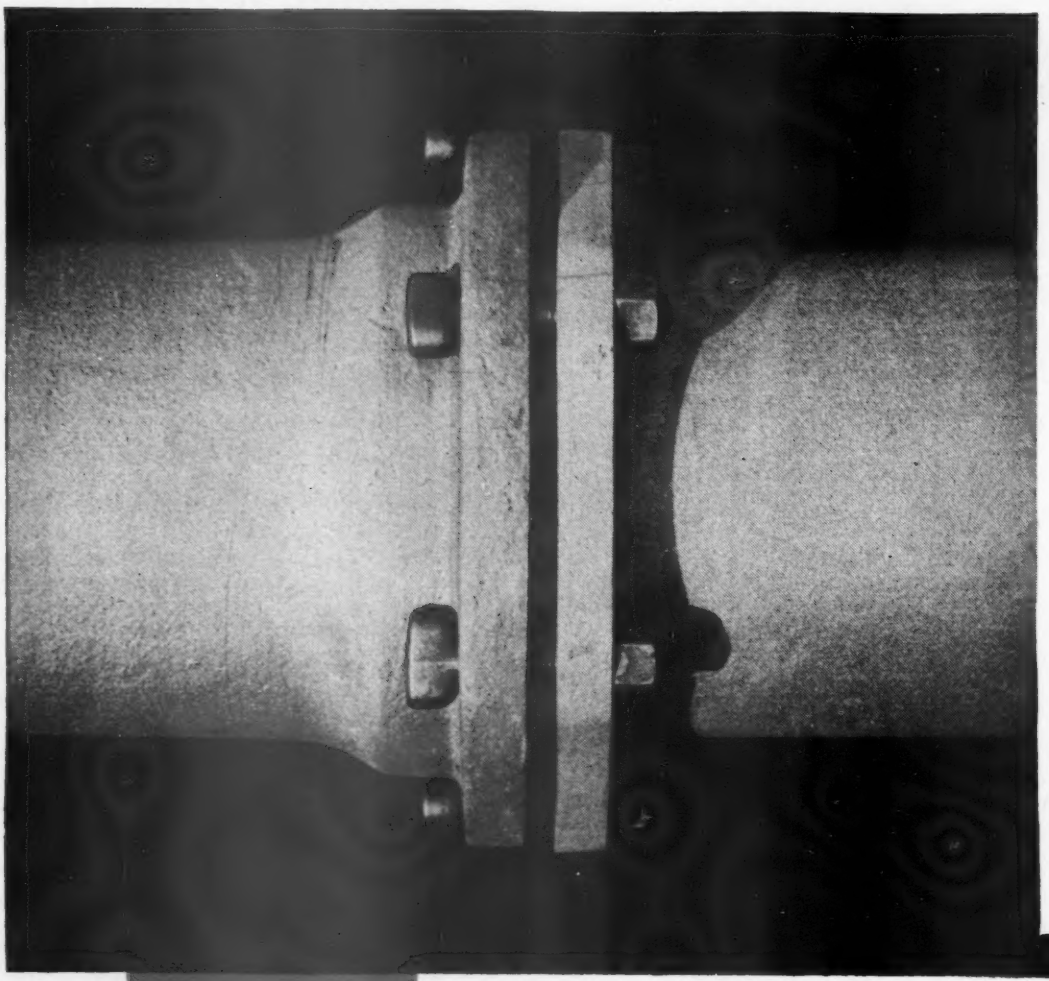

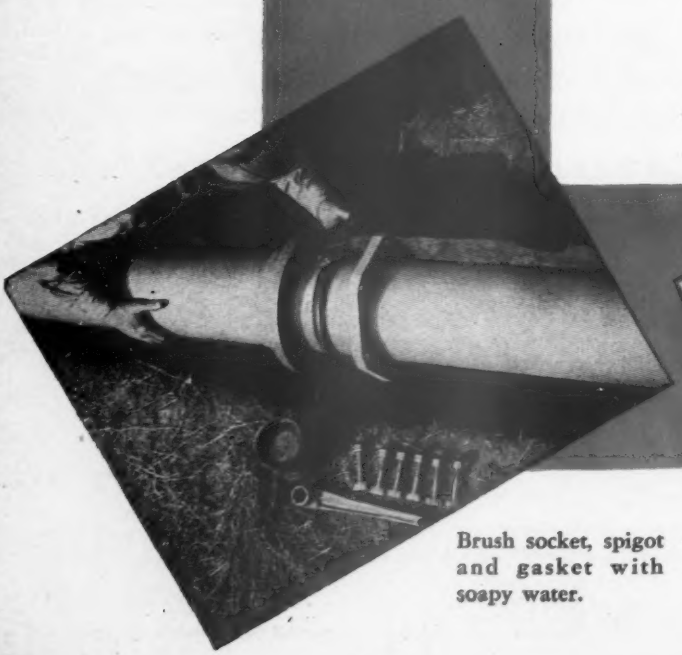

Brush socket, spigot and gasket with soapy water.

Slip gasket into position, making sure it is evenly seated in the socket.

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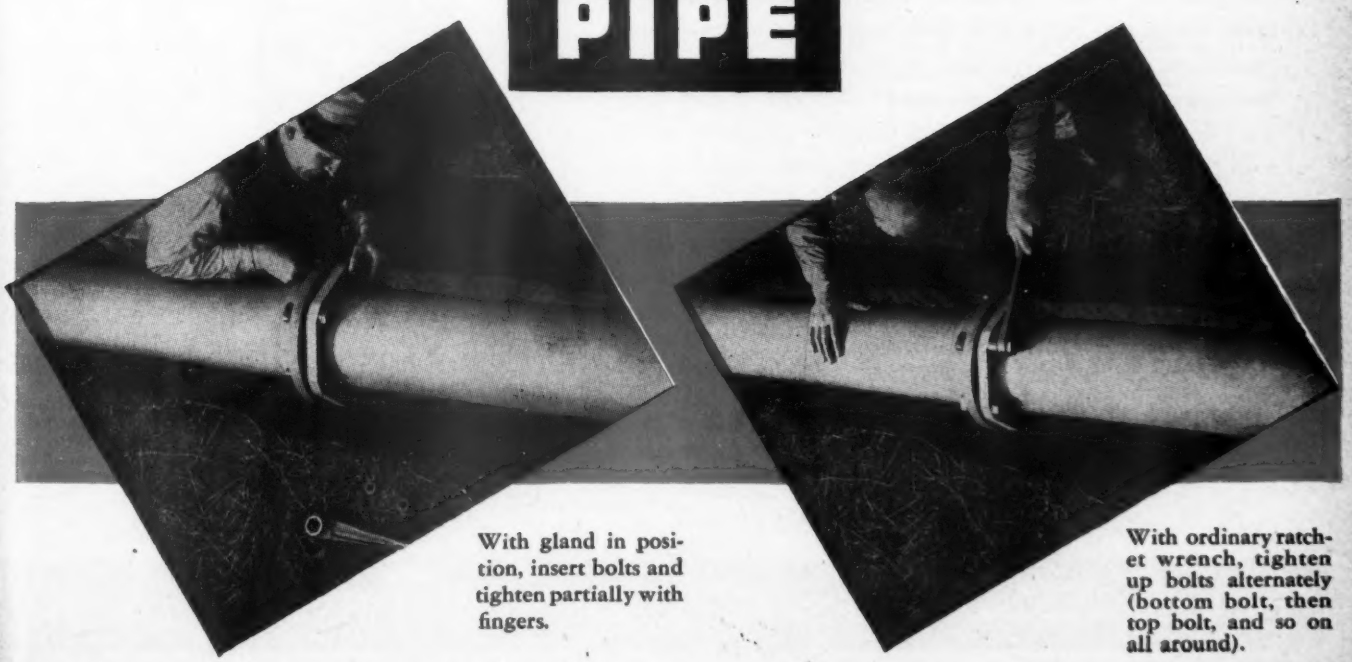

With gland in position, insert bolts and tighten partially with fingers.

With ordinary ratchet wrench, tighten up bolts alternately (bottom bolt, then top bolt, and so on all around).

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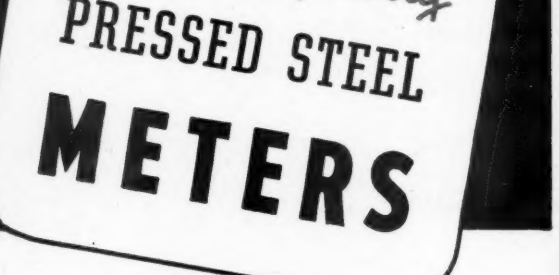

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Do You Plan to Convert to LP Gas?

A Discussion of Small Manufactured Gas Plants and Their Conversion to Liquefied Petroleum

By

Paul E. Peacock, Jr.

NOW that we are looking toward the possible end of the war, we are again making plans for increasing our operating efficiency. If we are to meet the increased electric competition brought about by excess generating capacity of the electric plants, we must plan now and plan well.

Many owners of small manufactured gas plants are finding it increasingly difficult, in the face of rising costs, to meet competition under their present operating conditions. The salvation of many of these small manufactured gas plants lies in conversion to liquefied petroleum. Quite a few owners of small manufactured gas plants have realized this and are making plans to convert as soon as equipment is available. With this in mind the author has written this paper in the hope it may be of assistance to some operators.

The advantages to be realized by converting to liquefied petroleum are many, but the greatest is the advantage it offers in economy of operation. Few small manufactured gas plants can begin to compete with liquefied petroleum on a "cost at the meter" basis. In making cost comparisons of liquefied petroleum and manufactured gas you must also take into account the advantages liquefied petroleum has to offer which are not directly associated with production costs.

Some of these advantages of liquefied petroleum are:

1. Because the liquefied petroleum gas is a clean gas and free from the deposits common to manufactured gas, the number of service calls will be reduced by a large per cent.

2. With liquefied petroleum it is possible to maintain a closer heating value of the gas and thus further reduce the number of customer complaints.

On the conversion of the property used as a basis for much of this discussion the actual conversion was to natural gas. Natural gas is a dry gas such as liquefied petroleum and offers almost identical conversion problems. The other discussions on liquified petroleum are from the author's actual experience over a period of fifteen years in the engineering and operation of eleven systems utilizing liquefied petroleum—Ed.

3. The capital outlay for a liquefied petroleum plant is much less than for a small manufactured gas plant.

4. The depreciation of a liquefied petroleum plant is lower than that of a small manufactured gas plant.

5. Because the liquefied petroleum equipment operates automatically there is no need for a regular plant operator. The supervision of the automatic controls can be done by one of the service men or the manager of the property himself.

6. The distribution operation expenses will be materially reduced because of the cleaner gas which eliminates drip pumping, etc.

7. With liquefied petroleum will come a definite improvement in customer relations and the acceptance of gas, the modern fuel. The cleaner gas will place the company in a decidedly better competitive position.

Since we have discussed some of the advantages of liquefied petroleum, it would be well to go into detail on some of the angles to be considered in converting a small manufactured gas plant to liquefied petroleum.

The Distribution System Before and After Conversion

If manufactured gas left the plant entirely free of all suspended matter and remained in that state up to the point of consumption, then the matter of converting a manufactured gas plant to liquefied petroleum would be a simple procedure. However, this ideal condition seldom exists in a small plant. The result is that the entire distribution system, the meters, regulators and consumers' appliances are coated internally with deposits of various types.

The Distribution System Before Conversion

In the average small manufactured gas plant tar, gum and naphthalene are passed out into the distribution system where they condense in the mains, services, regulators, meters and appliances. The degree or extent of these deposits is controlled by the amount of equipment available at the plant for cleaning the gas and by the extent that good manufacturing procedure is followed.

It is possible to have equipment to remove a very high per cent of the impurities found in raw manufactured gas, but the complete equipment is usually too expensive for the average small plant. Because of the deposits thus passed out into the system it will be necessary to give special attention to the deposits when converting to any dry gas such as liquefied petroleum.

The property on which much of this conversion discussion is based was in as bad a condition as will be found so far as deposits are concerned. For this reason it should not

be assumed that all properties will have the degree of trouble encountered on this one.

Before the conversion was started several samples were cut out of the mains over the system to determine the extent of the deposits. These samples gave an indication of the problem to be faced after conversion. As a further check, the meters were examined and it was found the diaphragms were thoroughly impregnated with gum and tar which had entirely replaced the diaphragm oils.

Because the deposits were so heavy, equipment was bought and arrangements made to rehydrate the converted system with steam and oil fog. This was advised by leading engineers as a preventive for drying of the mains, services and the meter and regulator diaphragms.

It might be well to discuss the effect of the conversion on each part of the distribution system separately, so this will be done.

MAINS: No noticeable benefit was realized from either the steam or fog. This statement is made because the deposits dried out and naphthalene was prevalent despite the steam and oil fog which was intended to correct the condition.

As the deposits in the mains evaporated and dried out, a serious leakage problem developed. The leakage was first noticed on the increase about six months after conversion, and it increased considerably for the next six months until it was finally brought under control. Had better leakage control been maintained before and immediately after conversion, the matter would not have reached such proportions; and it need not offer a serious problem with any conversion.

At first several months were spent in installing main line valves so the system could be sectionalized for leak checking. As the leakage began to get out of hand it was necessary to abandon the valve project for the time being and resort to other methods of leak finding. If the valves necessary for sectionalizing had been installed before conversion the matter of locating the leaks would have been greatly simplified. The installation of such valves prior to conversion is highly recommended.

Since it was not possible to use the sectionalizing method of locating leaks in this system the "vegetation" method was selected as next best.

The author does not profess to be an expert in vegetation surveys, but after some preliminary checking the method was found to be quite simple and very reliable. The leakage had by now become so great it was no trouble to spot dead or dying vegetation at many points over the system. Most of the indicated leakage was at street intersections.

After one or two street intersections had been opened, it was found that the source of the leakage was old-style fittings. These fittings had been used at every intersection where laterals were run to side streets or where lines joined. The gaskets used had been the old style which were not tipped to protect them from the deposits in the main. Until the conversion the gaskets had been replaced by the deposit which had destroyed them and the joint had been left sealed. As the dry gas came in contact with the deposit, it began to evaporate and dry out and left the joint unsealed. A bad leak was the result. To repair the leak, a new gasket was installled under pressure. The gasket seat was thoroughly cleaned and soap was packed in back of the seat to seal the joint while it was being cleaned. The new gasket was installed after it had been cut in two on an angle.

After the first leaking fittings had been repaired, the system was covered systematically and every intersection opened where gas mains joined or crossed.

Fortunately the soil condition was such that all of the lines were in almost perfect condition so far as rust was concerned, and no main leaks were found other than at the fittings mentioned. With some properties this will not hold true and the pipe will be found badly pitted. Where this condition exists some leakage can be expected from rust and pit holes which may be sealed off with the deposits in manufactured gas.

Very little trouble was encountered with the mains because of the conversion except for the leakage. The first winter some trouble was given with naphthalene deposits collecting in small mains but this was not serious. Two small mains were plugged off by naphthalene which were cleared by injecting gasoline into the main through a service uphill from the obstruction and allowing it to run down to the obstruction. After the gasoline absorbed the naphthalene, it ran on to a drip where it was pumped out. The location of the obstruction was found by checking pressures from block to block and then service to service until the obstruction was located between two services.

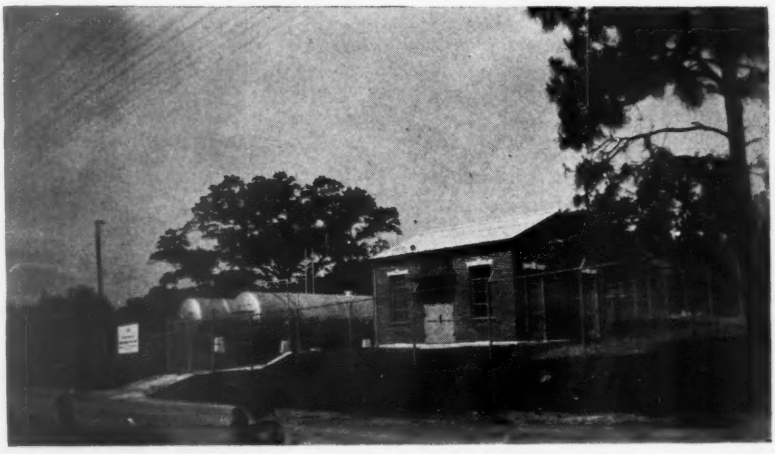

Fig. 1: Brewton, Alabama, municipal plant installed in 1937 with assistance of P.W.A. Funds. On the right are doors to electrical control room and tool storage room. Tanks are for liquid storage and for mixed gas storage.

SERVICES: As with mains, the soil condition was not hard on the service lines and none of them were found to be pitted. The main source of leakage with services was at gaskets and most of these were gaskets under service saddles. The repair of the leak was quite simple and consisted of loosening the saddle bolts and installing a new gasket. Lead ring gaskets were used for the repairs, but sometimes these are not the best if the connection is not below the frost line. In the case of lead gaskets under saddles above the frost line, the action of the frost may loosen the lead seat and cause a leak, since the lead is not as resilient as a composition gasket.

While soil conditions did not affect the service lines of this particular property, this will not hold true with

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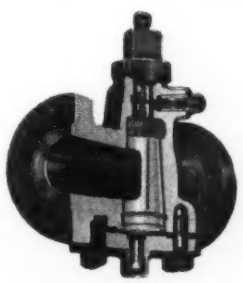

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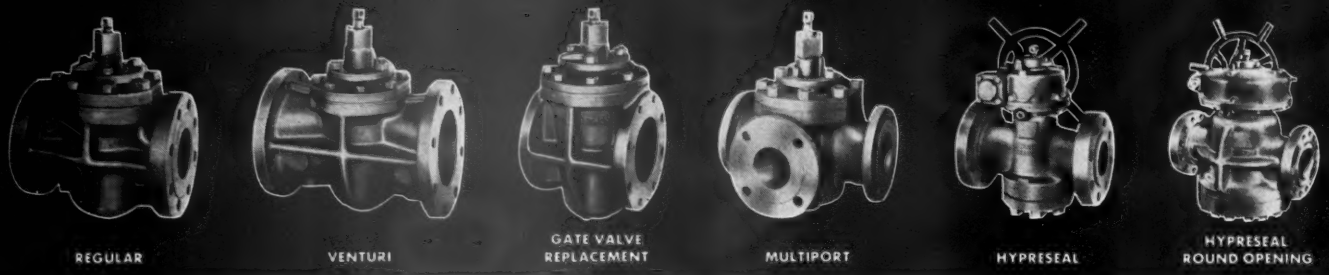

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all systems. Some older systems may have badly pitted services which will have to be replaced once the deposits are evaporated. Many of these old services will be leaking with manufactured gas, but with leaks so small they are not considered serious enough to bother with. As with the mains, if all the existing leaks in services are repaired before the conversion the leakage after conversion will not be serious.

In replacing services, one less expensive way is to install copper tubing by running it through the old service pipe. This saves the labor of digging the service ditch, cutting the pavement except at the main and eliminates the ill will of the customer caused by digging through his lawn.

Other than the leaks at the gaskets very little trouble was encountered with service lines. However, some trouble was given by naphthalene deposits obstructing the service and this was dealt with the same as with the mains. Another trouble was from the moisture which collected in some shallow services and froze during the winter. The frozen moisture was usually removed by injecting alcohol into the service and then blowing it out into the main. In a few stubborn cases an electric thawing machine had to be used by connecting it between two adjoining services. Because of the moisture the rehydration equipment was shut off the first winter and no more trouble developed. The naphthalene disappeared after the first winter and it was thought all of it had been evaporated and picked up by the passing gas and expelled through the burners.

METERS: Second to the leakage in importance was the meters. As pointed out under the section covering the system before conversion, the meter diaphragms were impregnated with gum and tar. This impregnation with gum and tar and the replacement of the diaphragm oils is what caused the meter trouble.

This small manufactured gas property did not maintain a meter repair shop for repairing tin meters. Such meters were sent to the factory or a larger property for repairing and rediaphragming. As a result of not having a meter repair shop this property had been gradually replacing meters with a type which could be easily rediaphragmed locally. Approximately fifty per cent of this latter type of meter was in use. The other fifty per cent consisted mainly of old tin meters far past their normal life of usefulness.

It was hoped before conversion that the oil fog would protect the oils in the meter diaphragms and keep the diaphragms resilient, but as mentioned before, the gum and tar had replaced the oil and so impregnated the diaphragm the fogging oil did no good at all. While the degree of the deposits and the age of the meters in this property presented a serious problem it is doubtful any other property will face a meter problem so severe.

At first customers complained from fluctuating pressure and pilot light outage. The pressure would fluctuate and the pilots go out from a sudden drop in pressure caused when larger burners were turned on and the meter was slow to respond. This lagging of the meter was caused by the diaphragms becoming stiff as the gum and tar evaporated and left them dry. Later on, low bills were noticed and finally "dead" meters began showing up.

As the first meters were removed and their condition noted, a systematic rediaphragming of the meters was started. By the end of two years practically all of the easily rediaphragmed meters had been repaired. The older of the tin meters were junked because they had seen more than their normal share of service.

Pre-Conversion Recommendations

Since the main source of concern with the distribution system to be converted is from leakage, it is well to make certain recommendations.

If the manufactured gas system is in good order BEFORE the conversion the leakage will not be serious after conversion. The greatest trouble will lie in small leaks now existing with the manufactured gas which are partly sealed off by the deposits in the lines. If these small leaks are repaired as they should be, the conversion should not offer any serious concern.

It is recommended that at least two surveys a year be taken on any system to reduce leakage to a minimum. This is especially to be recommended for at least a year before conversion to a dry gas such as liquefied petroleum.

Following is a discussion of the various types of liquefied petroleum and one conversion procedure.

Selecting the Type of LP Gas

The more prominent types of liquefied petroleum gas systems are Butane-Air, Propane-Air, (Gas-Air), and Undiluted Propane. All of these types have some advantages and are favored by different engineers.

One condition common to the types except Undiluted Propane is the changing Btu. value of the finished gas brought about by changing temperatures. This change is evened out to an extent by high pressure storage tanks or surge tanks mixing all gas made before it reaches the mains. However, the gas-air system is a venturi mixer rather than mechanical and the changing Btu. has presented a more serious problem.

The author was one of the first engineers to accept the fact that changing temperatures of the vapor or air caused the varying Btu. of the finished gas. Installation of four plants in Alabama with tempering coils to correct for the changing temperatures has proved the author's contention in this respect, and recording Btu. instruments along with recording thermometers have demonstrated the condition.

Fig. 2: Ozark, Alabama, municipal plant installed in 1936 with assistance of P.W.A. Funds. The mixing assembly was by Cutler-Hammer and the design of the assembly made up by them. This plant is 1½ blocks from the Court House and business district which gives an idea of the location possible for such a plant.

It was realized it was not practical to attempt to maintain control over the air temperature, since the air temperature changed with the weather and from day to night. The most logical approach then was to bring the vapor temperature to that of the air before the two were mixed. This was accomplished by installing suitable tempering coils in the vapor line before it reached the mixing assembly. After going through the tempering coil the vapor temperature was the same as that of the room, and this air was the air being mixed with the vapor. Under varying conditions the vapor temperature may be raised or lowered to meet the air temperature, but by having both at the same temperature at the time of mixing the relative Btu. remains constant.

For support of this theory that changing temperatures account for fluctuations in the Btu. of the finished gas, we have but to apply some simple factors:

Let us assume:

Btu. value of Propane vapor at 60° —2520 Btu. per cubic foot.

Btu. value of finished gas to be 550 Btu. per cubic foot.

Under this condition the finished gas will have:

218 cubic feet of vapor at 60° per thousand cubic feet.

782 cubic feet of air at 60° per thousand cubic feet.

Now the air temperature increases to 95° because of weather conditions and the vapor temperature (being controlled by the heat exchanger and other equipment) remains the same. With this condition we have:

782 cubic feet of air x .9369 (temperature correction factor), or 733 cubic feet of air which is still being mixed with 218 cubic feet of vapor. This then gives us a vapor-air ratio of 218/733 instead of the original ratio of 218/782. This increased ratio of the vapor to the air raises the Btu of the finished gas to 578 instead of the original 550. The same condition will exist inversely with a lowering of the air temperature.

Temperature variations in the vapor will account for some change in Btu. values, but since the percentage of the vapor is not so high or the change of temperature so great it does not present much of a problem.

With some of the later plants the Btu. of the finished gas has been raised to around 900 Btu., but this does not eliminate the change in Btu. The raising of the Btu. just reduces the percentage of change in respect to the total Btu. If we apply the same correction factors in the order we did above we will see that under the same conditions with 900 Btu. gas we will get a Btu. value of 938 when the air temperature raises to 95°.

As pointed out regarding the Alabama plants, it is possible to correct for this fluctuating of Btu. value by installation of a simple tempering coil on the vapor line; however, very few plants have as yet installed such coils.

Now that we have discussed the one condition which must be considered with some plants and corrected for, let us examine the individual types of liquefied petroleum gas.

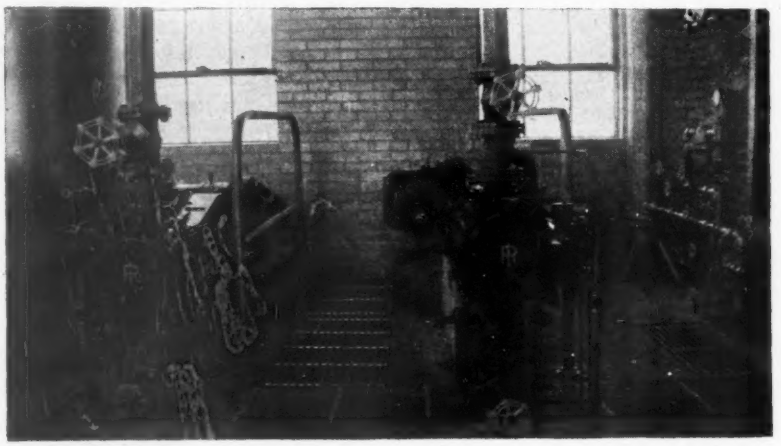


Fig. 3: Inside view of plant showing two compressors (small ones,—3 x 5 and 5 x 7) with pipe trench in floor with grating. Both compressors are connected to take gas into the gas storage tanks or direct into the mains as may be desired.

Butane-Air

This type was the earliest of the liquefied petroleum gas systems and many are in use today. Various types of equipment were used for mixing the vapor with air and included the Kemp Machine, Selas Machine, Cutler-Hammer mixing control. Fischer proportioning valves, fixed orifices and others. The Kemp Machine and Selas Machine could be used as a booster for mixing direct into the mains or could be used as a mixing unit ahead of a compressor. This latter arrangement is most commonly used, and all gas is made into a high pressure storage tank and supplied to the distribution mains through regulators.

Most of the first Butane-Air plants had only one compressor and one mixing unit and depended entirely on electricity to operate the plant. In case of a breakdown of the one unit or in case of power failure a gas failure was threatened. Later plants have installed two or more compressors and mixing units and have gas or gasoline engines for operation of the plant as well as electric motors. This arrangement is quite an improvement over the original installations.

With the passing of years many other uses have developed for Butane liquid and it has become difficult at times to secure an adequate supply. Because of this factor, very few new Butane-Air plants are being planned. Some of the older Butane-Air plants have already changed to Propane-Air or Undiluted Propane and others will likely change as equipment becomes available.

With Butane, it is necessary to repressure the liquid storage tank in winter months in most sections due to pressure loss from temperature conditions. Some plants installed automatic repressure regulators where the condition was more serious. The Butane will become a constant liquid at about 14° above zero and at temperatures just above this will not deliver sufficient vapor by natural vaporization to take care of a mixing unit of normal size.

With bottled gas becoming so popular owners of Butane-Air plants have found themselves unable to take advantage of this new income with above ground tanks and compete on an even basis with other bottled gas dealers who distribute Propane.

This statement has held true with all but the far southern properties who use Butane for bottled gas with a measure of success. Some properties have attempted to use Butane in summer months and then buy Propane from another company for winter months as a bottled gas. This has not proven satisfactory because cylinders delivered during the summer will last some customers to the middle of winter and will give trouble the last month or so.

The latest arrangement of Butane-Air properties is to specify a Butane-

Propane mixture according to the average temperature of their locality. This mixture has helped considerably in many properties, both from the repressure angle and also from the bottled gas business angle.

Propane-Air

This type of plant is almost identical to the Butane-Air plant and has become more popular as Butane has become hard to get. Propane has operated quite satisfactorily, but in some plants trouble was encountered in winter months because no vaporizing equipment was installed with the plant. It was felt by many engineers that the atmospheric heat would provide sufficient heat to vaporize the Propane all year. In one such plant in Iowa it was necessary to heat the liquid storage tank one severe winter to keep the plant operating. The next spring a vaporizer was installed and has been used much of the time since.

Because of the lower boiling point of Propane and its higher pressure at normal temperatures it is not necessary to repressure the liquid storage tank in winter months as with Butane.

With Propane, the operators have been able to go after the bottled gas business in earnest and many of them have built up such a good bottled gas business the distribution property has fallen to second place in income importance.

Some maintenance of plant equipment will be encountered with Propane-Air as with Butane-Air and there will be the condition of power failure as with electrically operated Butane-Air plants. The changing Btu. values will be to a lesser degree with Propane-Air than with Butane-Air.

Gas-Air

The Gas-Air unit is the latest type of plant to be recommended. This system uses Propane and its natural pressure as a mixing agent. Use is made of the velocity of the vapor going through a venturi at relatively high pressure to draw in a controlled amount of air for the desired Btu. of the mixed gas.

This type of plant usually mixes direct into the distribution system and handles the changing load conditions by several units set to cut in and out as load requirements demand. Because the usual operation is direct into the distribution mains, temperature changes as described earlier affect this type of operation. In a few plants of this type a compressor and high pressure storage tanks have been installed to take care of low off-peak periods by feeding such periods out of the high pressure tanks through regulators.

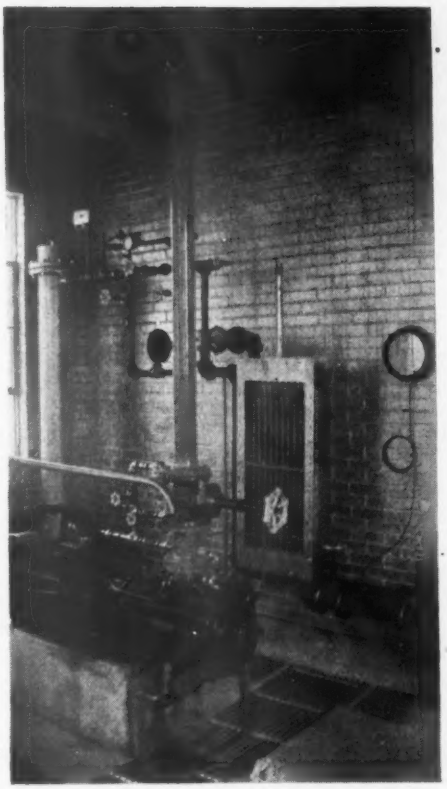


Fig. 4: Inside view shows the vaporizer assembly with tempering coil. Recording thermometer is mounted on wall and records the vapor temperature as a check against room temperature for mixing.

For the gas-air type of installation it is recommended that a surge or storage tank be installed or used to take care of periods when it is necessary to remove or repair the mixing equipment or other plant apparatus and lines. Some manufactured gas plants may find it advantageous to continue using the low pressure lift storage holder to mix into. This will even out any fluctuations in Btu. values and will also give a standby supply at all times. A control on the holder would cut the mixing unit on and off as the holder raised and lowered. There would be the problem of the holder water in some localities, however, in winter months and it may be necessary to install circulating pumps for the water or a heating boiler for heating the holder water in extreme weather.

Undiluted Propane

This type of gas has come to the fore in the past few years and is now being accepted by many who at first objected to it because of certain reasons they felt important. It was the author's good fortune to install one of the early undiluted propane plants and systems in the country and since then the owners have converted at least two of their Butane-Air systems to undiluted propane.

The one company in mind started with the one undiluted propane plant as a nucleus and has since built up one of the better bottled gas businesses in the country. Today, the distribution systems of that company are just incidental operations to the bottled gas business.

One of the most frequent objections heard to undiluted propane is that the leakage would be so serious with the higher Btu. value of the gas. This is true if you do nothing about your leakage until it gets above 10%. If you are of the school of thought which is, "any gas leak is TOO much," then you will not worry about leakage with propane. Modern operators get after leakage and make repairs promptly.

One Conversion Procedure

Distribution System

Before attempting a conversion survey you should have a thorough knowledge of your distribution system and an accurate set of maps and records. Every valve, drip, riser or other device in the system should be located and *tested by actual operation* to see that it is in good operating order. When this part of the preliminary survey is finished you are ready for the next step.

1. Map of System: After you have the city map showing the distribution system with all its appurtenances trace it off on a plain sheet of paper so the traced map shows only the distribution system without any of the streets or other markings which appear on the original city map. This map will give you a perfect picture of your system and will enable you to plan the sectionalizing of the distribution system.

2. Sectionalizing: The object of sectionalizing is to isolate a small section of the system from the rest by closing certain valves. For conversion purposes the size of the section should be governed by the number of customers or appliances rather than the blocks of mains. Besides being very necessary in most conversions, the sectionalizing is great help in leakage survey work. Start

at the farthest point from the gas plant and determine what lines may be isolated with existing valves. If necessary, install new valves or a short extension to reduce the size of the section. At one valve location of each section you should tap the main on each side of the valve and run a riser to the surface at the curb line. These risers will be used in leakage survey work for metering gas to that particular section after all valves to the section have been closed and the gas passed through the meter. In leakage survey work, the metering of gas to any section should be done late at night when there is no normal load. Readings on the meter test hand should be taken with a stop watch every fifteen minutes and these readings recorded. The lowest reading will give you the approximate leakage after deducting estimated consumption of pilot lights, etc. The readings should be kept for comparison with future readings so you can tell whether the leakage in that section is on the increase or decrease.

As the first section farthest from the plant has been isolated you add another section to the first by working towards the plant. This procedure is continued until all but the last few blocks around the plant have been isolated from the plant.

This same sectionalizing procedure can be applied to sections being supplied from governors on high pressure loops which feed into the low pressure system. In this procedure you convert the high pressure loop first with it cut off from the low pressure system and then add section by section of the low pressure to the converted sections.

This section of converting the distribution system is written with the thought the conversion will be to undiluted propane. If that is not the type of gas you plan to use you will have to use the high pressure loop system of conversion or divide the distribution system as best you can from the gas plant location.

Appliances:

Before you can convert the appliances in your gas system *you must first know what appliances you have to convert.* The job of listing those appliances is not to be dealt with lightly and no stone should be left unturned to list EVERY appliance connected to your lines.

1. Appliance Survey: For the appliance survey you will need cards printed to list each customer and the appliances he has installed. The survey card should have spaces for such things as the customer name, address, meter number, telephone number and such other information as local conditions may indicate. Besides this information, you will need a space for each appliance so you may show the type, serial number, kind of control and a space for remarks as to the type of conversion recommended, i.e., whether a new burner or conversion of the old burner. Some of the survey cards should be red for use with hospitals and other emergency installations which should be converted first.

2. Utilizing Survey Card: The completed survey cards should be analyzed by a competent person and arrangements made to order the conversion material. The type and kind of material ordered for each job should be listed on the back of the card in appropriate spaces so the conversion man will know just what material he is to use on the conversion of each appliance.

On refrigerators, as on some other appliances, it will be necessary to order new burners. It will be more economical to replace such small appliances as bunsen burners, cigar lighters, etc. than to attempt to convert them.

3. Ordering Conversion Material: Some engineers recommend buying all conversion material from the maker of the appliance while others recommend buying from companies that specialize in conversion supplies. A combination of the two works very well, and if you do not have an experienced person ordering the material it would be recommended that much of the material be secured from the manufacturer of the appliance.

All material should be ordered in such a way as to identify it with a particular job and when it is received it should be assembled with other material for the same job and kept together. Material for each section should be assembled together so it may be readily available when needed.

Turning In Of Gas

1. Temporary Gas Supply: If the conversion is to be to undiluted propane a temporary gas supply should be arranged for. A temporary set-up should be made along the first section to be converted. This is usually done by a battery of 100 pound (or larger) cylinders set up along the section and the gas fed into the section at a drip riser or other suitable connection. It should be kept in mind that the liquid will refrigerate as the gas is drawn off and sufficient tank surface will have to be provided to take care of the gas load. If sufficient tank surface is not provided the liquid will refrigerate to the point it will not vaporize sufficiently fast to take care of the gas load.

2. Notification: the date each section is to be converted should be determined and ample notice given each consumer as to the date and the hour of the conversion. Complete instructions should be given to each customer as to what they should do at the time of conversion, and especially those with automatic appliances. All automatic appliances such as water heaters and refrigerators should be cut off and left off until they are converted. Range ovens should not be used and top burners used only if adjustable by regulating the flame at the burner valve handle.

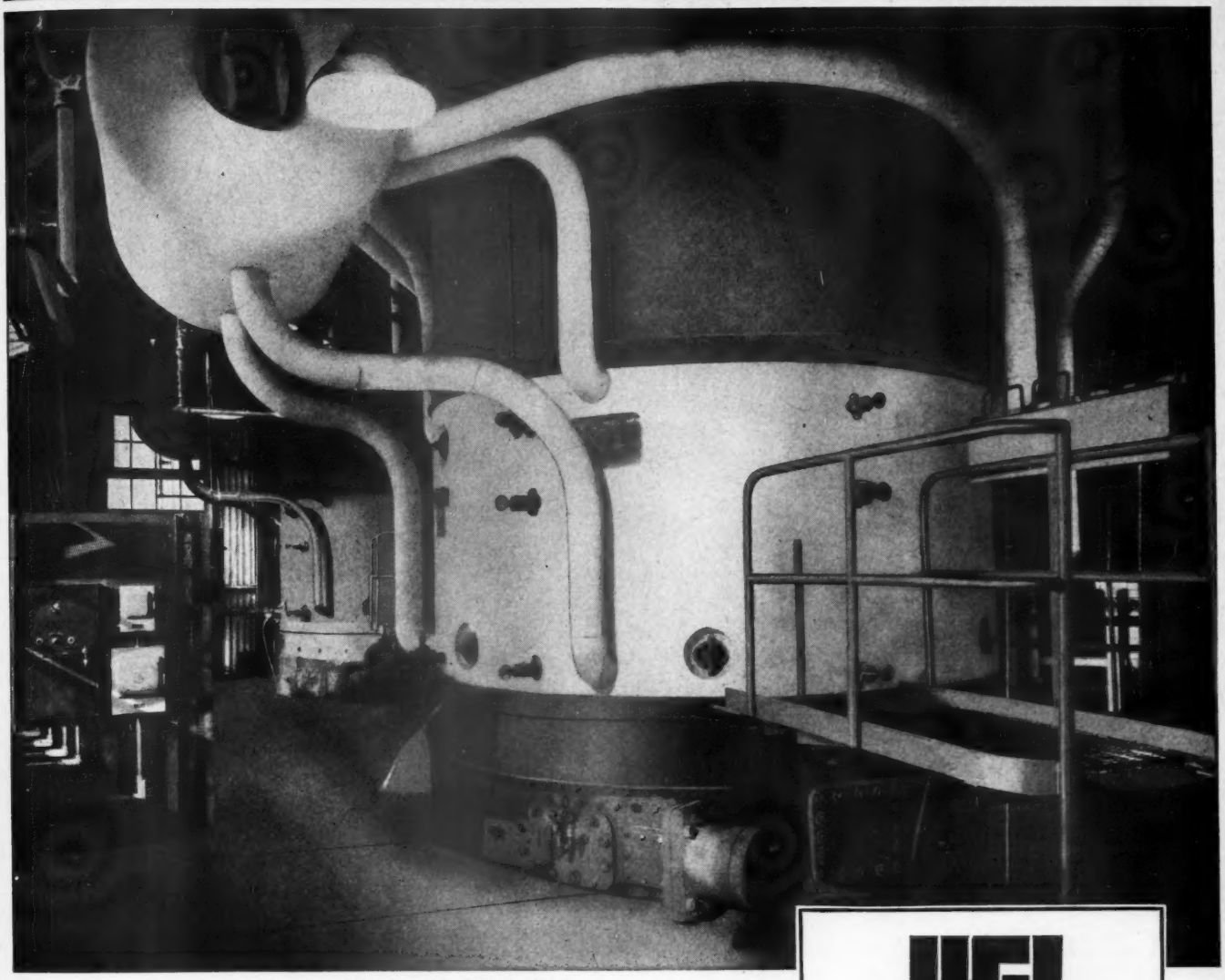
3. Order of Conversion: Before the actual turning in of the gas the conversion men should have in their hands the cards and supplies of the customers whose appliances will be converted first. These will be the red cards, then the refrigerators and automatic appliances and then the balance. If the conversion section is not too large the red cards and refrigerators should be completed the first night of conversion.

4. Purging the Section: As the hour set for turning in the new gas draws near, men should be placed over the section at strategic points to purge the section of all old gas. At the appointed time all of the men should purge the gas by burning after valves to the sections have been closed to isolate it from the balance of the system. As the valves are closed, the new gas can be turned into the lines. The flames at the point of purging will denote by their appearance when the old gas is purged and new gas reaches that particular point. A thorough purging job will eliminate a lot of call-back service work after conversion due to pockets of the old gas remaining in the system.

5. Appliance Conversion: Conversion of automatic appliances may be started several hours before the actual turning in of the new gas and then the appliances left off until the gas is turned in. This will speed up the conversion of those automatic appliances as only an adjustment will be necessary after the gas has been turned into the mains and the old gas purged. No adjustment of appli-

(Concluded on page 62)

U. G. I. MODEL "D" MECHANICAL GENERATOR



U. G. I. Mechanical Generator Sets at Philadelphia, Pa.

UNITED ENGINEERS provides you with UGI-designed apparatus which gives high efficiency, high capacity, and ease and flexibility of operation to economically meet the plant needs with the fuels available for use.

UNITED ENGINEERS provides you with an organization experienced in all of the problems of present day construction to design, construct and place into operation the facilities necessary for gas plant expansion.

UGI Organization

UNITED SERVICES PROVIDE

EXPERIENCE IN DESIGN
United has over 50 years experience in gas plant design.

EFFICIENT APPARATUS
United has pioneered major developments in water and coal gas production.

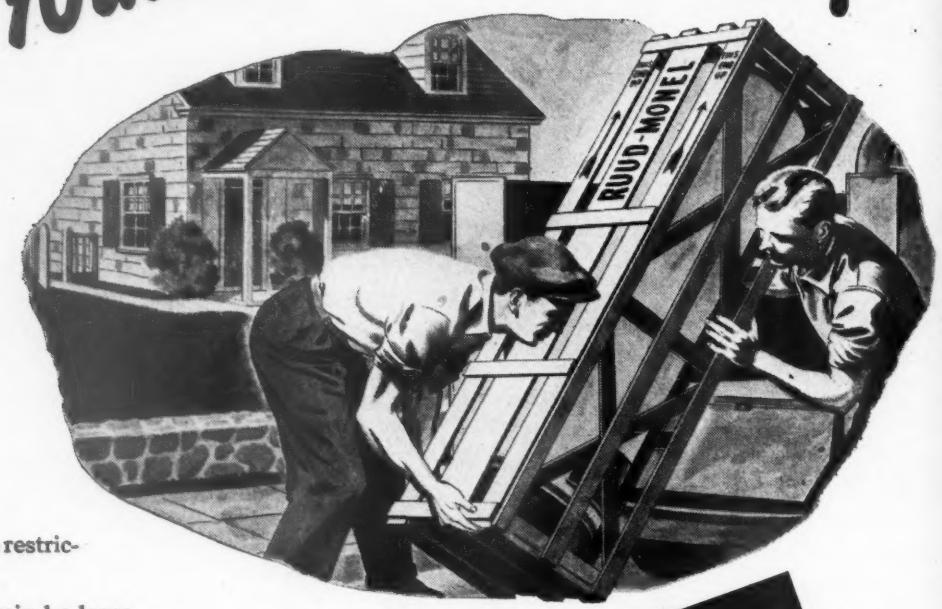
ECONOMICAL CONSTRUCTION
United has large well organized forces for gas plant and general construction work.

EXPERIENCE IN OPERATION
United has experienced plant operators for securing most efficient results.

UNITED ENGINEERS & CONSTRUCTORS INC

NEW YORK PHILADELPHIA CHICAGO

They're on their way ... to BOOST YOUR POSTWAR LOAD!



One of these days, wartime restrictions will be eased.

And your trucks will again be busy ... busy bringing your customers the service and satisfaction that goes with *perfect hot water service.*

For that's what folks *really* want ... and what they always enjoy ... when they purchase a Ruud Automatic Gas Water Heater with its long-lasting, *rustproof* Monel* Tank.

The Ruud-Monel line is a quality line, reasonably priced. It's a dependable line for utilities to handle ... and it appeals strongly to every buyer who refuses to gamble with this very *BASIC* home requirement—*hot water.*

BUILD LASTING PRESTIGE AND GOODWILL

See that *your* customers have water heaters that provide an abundance of *clean* hot water ... automatically without fuss or bother ... at any hour of the day or night.

Ruud, an outstanding name in the gas water heater field for more than half a century, welcomes your inquiries. When war restrictions are eased, the NEW Ruud Automatic Gas Water Heaters with Monel Tanks will be rolling off production lines ... to bring the *GAS* industry all the hard-hitting advantages of *two* nationally advertised, nationally promoted and nationally accepted products.

*Reg. U. S. Pat. Off.

RUUD MANUFACTURING CO., PITTSBURGH 1, PA.

H_2O HOT STUFF

It's not generally known, but Napoleon had a violent dislike for perfume. It was so obnoxious to him, that he wouldn't let his wife, Josephine, use any. So she bathed daily ... and thus set a precedent for *removing* dirt rather than disguising its presence.

★ ★ ★

The man who shaves every day, covers approximately 18,000 square inches of face in the course of a year. During the same time, his wife ... if she's an average housewife ... washes 13 tons of dishes, just about 216 times her own weight.

★ ★ ★

Benjamin Franklin had a unique bathtub built to his order. It was shaped like a huge baby's shoe. After filling the tub with water which had been heated on the kitchen stove or in kettles hung in the fireplace, Franklin would climb in. He'd sit in the heel, and stretch his legs out into the toe. Then he'd adjust his reading stand ... and sit in his bath and read.

★ ★ ★

Gas is the quickest heating of all fuels for automatic water heating. It's clean. It makes no dirt, dust or ashes. It's dependable and economical.

★ ★ ★

Ruud—a quality line since 1889—has been sold all over the world. And it will be again!

RUUD GAS MONEL ... perfect partners for *Automatic Hot Water Service*

Gas Water Heating Stimulated By Home Service Artful Aid

MORE than one hundred entries were received from Home Service Departments of gas companies from all parts of the country in the essay contest for Home Service on the subject "What Can Home Service Do To Aggressively Promote Adequate Gas Water Heating Service?", sponsored by the Water Heating Committee of the Residential Gas Section, American Gas Association.

This contest was judged by a jury including Miss Ada Bessie Swann, Consultant in Advertising, Woman's Home Companion, New York City; Norman J. Radder, Secretary of the Plumbing and Heating Industries Bureau, Chicago, Ill., and J. R. Lavelle, Chairman of the Water Heating Division of A.G.A.E.M., Sales Manager of the John Wood Manufacturing Co., Conshohocken, Pa.

The following is a list of the prize winners:

1st Prize—$150 in War Bonds:
Flora G. Dowler, Home Service Supervisor
Manufacturers Light & Heat Co., Pittsburgh, Pa.

2nd Prize—$75 in War Bonds:
Mary Louise Hurster, Home Service Director
The Laclede Gas Light Co., St. Louis, Mo.

3rd Prize—$50 in War Bonds:
Dorothy Zieber, Home Service Director
The Consumers Gas Co., Reading, Pa.

4th Prize—$25 in War Bonds:
Dorothy L. Bartley, Home Service Department
Central Hudson Gas & Elec. Co., Poughkeepsie, N. Y.

5th Prize—$25 in War Bonds:
Judith E. O'Flaherty, Home Service Department
Philadelphia Electric Co., Philadelphia, Pa.

Miss Dowler's paper follows:

Stay in the Safety Zone

Flora G. Dowler

"Stay In The Safety Zone" may mean many things. For example: it might mean to the person who drives a car, watch out for persons who might step out of the Safety Zone into your line of travel; to the person walking, look before crossing the street; to be cautious if the sidewalks are icy. But whatever it may mean to each of you, it all adds up to living a longer life. Whether you are Six, Sixteen, or Sixty, the Safety Zones along Life's Highway mean a lot to us.

How many of you, when leafing through a magazine and coming to a picture, stop to read the by-line? Especially if there is color, beauty, or youth. Of course you do. We all do.

The Six Year Olds are more interested in pictures of dolls, animals or a little girl washing her doll clothes, like Mother, or playing Nurse to her sick doll; or in a small boy struggling to give his dog a bath, or sitting at a lunch table eating his spinach so that he might grow strong like Pop-Eye.

The Sweet Sixteen is interested only in Glamor Pictures—it may be a new kind of hair shampoo to bring out the lights in her hair, or a soap to beautify her skin, or toothpaste to brighten her smile—whatever it may be, she is trying to make herself beautiful like her favorite movie star.

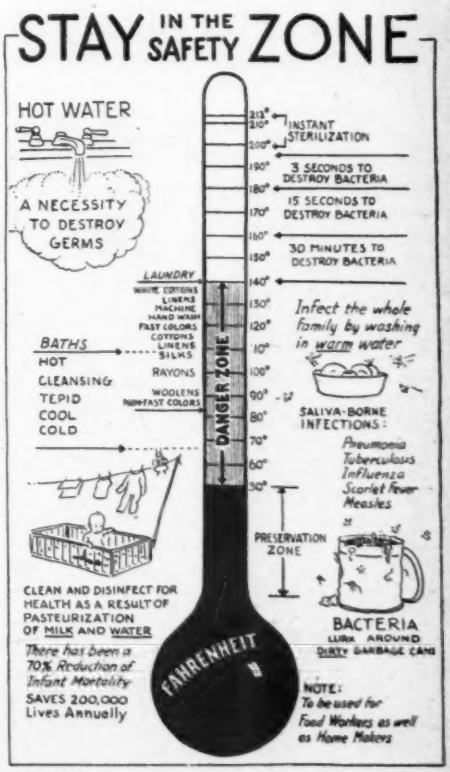
If you are Sixty, you will be interested in any fad or fancy to keep yourself young-looking such as a special diet or special machine to help take off any excess pounds you might have. Perhaps it is a new hair style, or an easy facial treatment to take away the appearance of strain and worry which you have acquired during the years.

We all want to be Beautiful, Glamorous, and Youthful-Looking, and will try almost anything to add More Life to our Years, and More Years to our Life. Would you like to have me tell you how I think it can be done?

Let us consider the first Safety Zone: *Good Health.* In order to have a Healthy body we must eat the right foods; eat three meals a day; get plenty of rest; and not worry. We cannot drive our car day and night for years without having something happen to it; parts wearing out or breaking down. Our car, in this case, is Our Body. We must take care of it, and Good Fuel, and the Correct Fuel, are essential.

Another Safety Zone is Personal Hygiene. From the day we were born our personal hygiene was considered by the Doctor, Nurse, and Mother. Every precaution was taken to insure complete cleanliness. Our daily bath water for the first 3 months was always 95° to 100°F. The baby's clothes were kept clean; nursing bottles thoroughly washed and sterilized. I could go on for hours telling you of the many tasks throughout the days, months, and years which are routine and yet very important to our Personal Hygiene. These many tasks could not be done well without twenty-four hours of Hot Water Service in our homes.

I am sure you will be interested in some newsy items about the early use of hot water. The Greeks and Romans were the first to use hot water extensively. They loved the comfort and luxury, and believed as we do today, that frequent hot baths contribute much to better health. Some of the Public Baths were built



on a huge scale, accommodating as many as 3,000 persons at one time, with the water in the gigantic pools kept hot by furnaces beneath the floors.

With the decline of Rome's glory, the love of bathing passed so completely that the Dark Ages which followed are sometimes termed the "Bathless Centuries." In the year 1127 the famous "Order of the Bath" was founded in England. Every candidate for this distinction first had to scrub himself thoroughly as a token of purity. There was a rumor that Queen Elizabeth bathed secretly. Napoleon, in a peculiar way, is also linked with hot water history. He violently disliked every kind of perfume with the result that his wife Josephine, being deprived of this accessory to feminine charm, bathed daily and established a precedent in the liberal use of hot water.

Americans are known throughout the world for their cleanliness, and by comparison with the other nations, for their liberal use of hot water. With all this, we find that the simple practice of frequent bathing in the early days was frowned upon by prominent leaders. Andrew Jackson, in order to win popular favor, condemned the use of bathtubs, and had torn out of the White House the bathtub that Dolly Madison had installed there. Later, Benjamin Franklin went to the expense of having a copper bathtub built for his own use. This tub was very unique, for it was shaped like a giant shoe. He would sit in the heel and stretch his feet well up toward the toe.

Years have passed by, and many changes in our standard of living have taken place. But have we progressed as much as we should have in our highly civilized country? From the 1940 Census I found these figures. You will be interested, I know.

In the state of Pennsylvania there are 2½ million dwelling units. Of the families in them 30% do not have bathrooms. In other words—no tubs, showers, or inside toilet facilities. Only two-thirds of the dwellings which do have running water have bathrooms installed.

You begin to realize that with these conditions existing in the United States—and we are farther advanced as compared with other nations—there is still much to be done to better our standard of living and health conditions. It is *One Thing* everyone may have, since there is *no law* prohibiting bathtubs or how many baths you may take in a day, week, or month.

Do you think the daily bath is essential? Yes; of course it is essential; for Health. We need daily baths to remove the dirt and grime from our bodies. Plenty of rich, creamy, soapy lather, and lots of hot water, are two essentials for a cleansing bath.

It really doesn't matter whether you bathe morning or night; take a shower or tub, or wash from a bowl. The important thing is to scrub well, rinse well, and dry yourself. Thorough cleansing removes dirt, dust, grease, worn-out skin particles, oily secretions, and perspiration which, if left on the skin too long, will ferment and leave offensive odors, and often cause skin disorders or blemishes.

The Bath does very little good unless the clothes we wear are clean. Whether wool sweaters or dresses, cottons or rayons, they must be kept clean. Your body eliminates nearly a quart of liquid a day through the sweat glands. Some of it evaporates, but at places such as our armpits, evaporation takes place slowly, so again fermentation takes place and there is an unpleasant odor.

As I mentioned before, Napoleon disliked perfume, and so Josephine bathed daily. Let's not cover up dirt, grime, and odor with face powder and perfume but use a cleansing bath daily.

For the overly-tired person a hot bath to relax the nerves for a "picker-up'er," try a hot shower—*hot* water, then tepid water, and a quick rub-down.

Your personal appearance on the job or in getting a job is an important factor in this busy work-a-day world. Your hair, hands, skin, and clothes are only a few of the dozens of things involved. Can you think of any one item more important to personal hygiene than Hot Water twenty-four hours a day?

I hardly know how to begin to tell you about the next Safety Zone. Great scientists have been giving their entire lives for years so that you and I might live in a better world, and live longer. They have been studying various types of diseases; isolating germs; finding causes and cures. Yes; there will always be Disease. But folks, we have come a long way because Science has never ceased to study. Disease is more deadly than a Dive Bomber. Disease has been known to take the lives of hundreds and thousands of people because they didn't know how to prevent the spread of the deadly germs.

Scientific research has proven that the *cause* of many common illnesses and the spread of diseases is the *lack of cleanliness*. As I mentioned, the United States is considered the creanest nation in the world, and yet, have we done all we can to prevent the spread of germs and bacteria? In hospitals and doctors' offices we find that Hot Water is essential; in beauty shops and laundries, Hot Water is essential; in the hotels and restaurants, large and small, Hot Water is essential; and so the story goes. Everyone realizes that Hot Water really plays the lead in everybody's life.

One household task—a daily task that plays an important part in stamping out the most common germs —is Dishwashing. In the Army Kitchens the dishes must be washed thoroughly in from 118°F. to 140°F. water, and rinsed in water ranging from 160°F. to 180°F. Many tests have been made which show that saliva-borne bacteria from used eating utensils is one of the most frequent causes of infection and disease, causing epidemics. Most of us can recall when there was an epidemic of influenza, or trench mouth or, most of all, the Common Cold that goes from one member of the family to another, or through a school. One-fourth of our population suffers from four or more colds a year. Many of these colds lead to more serious illnesses. These you and I must help prevent by taking proper precautions.

This could mean that too many of our families are washing dishes with "Danger Zone" water, and rinsing in warm water rather than Hot Water. (See chart.) For further advancement of the present day Hygiene we must each do our part to Help Educate the Housewife, the Chef, the Restaurant Worker; the Corner Drugstore Employees; the School Lunchroom Workers; and the hundreds of other folk who are careless in the pasteurization of dishes and utensils, and Encourage Good Health by way of Improved Personal Hygiene; Improved Food Pasteurization, and Improved Sterilization. We must destroy germs and bacteria in order to assure Good Health; for a Better Nation in which to live.

To meet the essential requirements of Good Health, may we suggest that you see your Plumber or Gas Company Representative and have them help you select the proper type and size of *Gas Automatic Water Heater* to supply an adequate amount of Hot Water twenty-four hours a day, 365 days a year; for your lifetime and mine.

Play Safe for Health's Sake—Stay in the Safety Zone.

The new AMERICAN-Standard HOME BOOK helps to sell gas heating

Right off the press at a time when people are planning better heating for their homes comes this new American-Standard Home Book. In its pages the important subject of heating homes by gas—including winter air conditioning—is discussed, and equipment is shown in full color. There is also a section on gas water heaters.

Thousands of these new books are now being distributed to prospects by local heating and plumbing contractors. These contractors are also doing a real selling job for you by informing home-owners about gas heat and the type of equipment that will heat their homes most economically.

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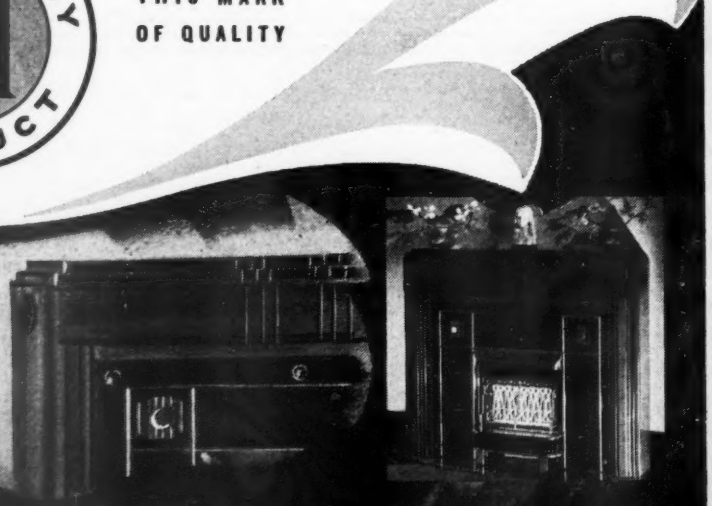

GENERAL GAS LIGHT COMPANY KALAMAZOO, MICHIGAN

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Servel's Concept of the New Freedom Gas Kitchen

A SINK, range, and refrigerator form the three basic appliances for a kitchen, but to make these into the New Freedom Gas Kitchen they must be integrated with the proper cabinets and accessories to form a working unit that will be acceptable to the American housewife. This combination will be offered in the New Freedom Gas Kitchen designed by Servel, Inc., Evansville, Indiana, it was announced this week by Geo. S. Jones, Jr., Servel's vice president in charge of sales.

This development makes it possible for Servel to offer the gas industry a kitchen planned to meet the specific needs of the gas served customer and in addition to offer a unit that is comfort conditioned to meet seasonal change. The new kitchen awaits only the release of materials and manufacturing facilities before getting underway.

This new addition to the line of products offered the gas industry by Servel will, with the exception of the "CP" gas range, offer a kitchen from a single source of supply complete with all component parts in integrated design including refrigerator, cabinets, sinks, and accessories.

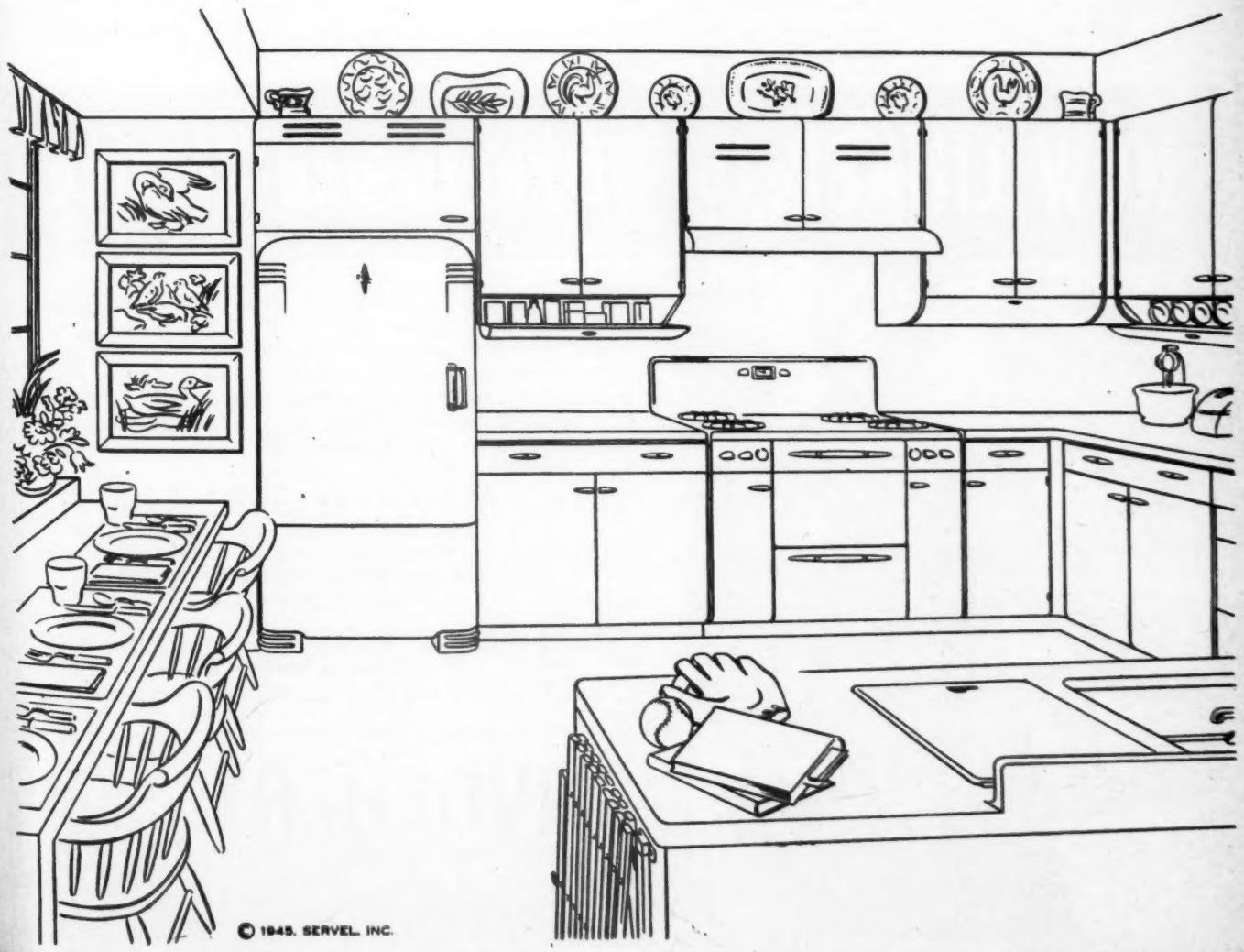
In announcing the new program Servel, according to company officials, is not disposed to enter into major competition with any of the companies manufacturing lines of kitchen cabinets. Servel's only interest is in its own concept of the New Freedom Gas Kitchen as a revitalizing factor in the promotional program which has been carried on by the American Gas Association on the national level.

Even with the progress which has been made toward reconversion the time has not come when brand advertising will do the most effective job for the gas industry as a whole. With the space limitations of consumer magazines the entire industry will be best served by a national program which stresses gas as the fuel of the future.

In bringing out their new line at this time Servel is offering the individual gas company an opportunity to have in the immediate future an integrated kitchen to offer their customers which will tie in with the national plan.

The complete Servel plan will within a short time, have not only a full kitchen line but also all of the tools for effective merchandising of the new product.

They feel that this new line will revitalize in the individual community the promotional program of the New Freedom Gas Kitchen which thus far has been strictly on a national basis. Working on the theory that in the early stages of resumption of sales activities the industry as a whole will have only a short time to prepare a sales program to maintain prewar markets plus the necessary expansion in the postwar era . . . this expansion to be carried out in what will eventually be a highly competi-



tive field. To accomplish this it is imperative to plan a completely integrated sales promotion program at both the national and local levels to produce a consumer acceptance of lasting quality.

On the national level this "Hold the line" activity needs no material identification, but in the individual community where the consumer can and will come into the salesroom for information there is a need for a definite line and program. This new Servel line, the company feels, will offer the vehicle needed for this type promotion. On the sales floor the customer, even now, wants to know what will be offered as the replacement for antiquated equipment in the immediate postwar years. These questions will be answered by the Servel Gas Kitchen.

Knowing that the pent up demand in the home appliance field will soon be satisfied after the release of new products and then the battle of the fuels will be on, Servel developed their new gas kitchen with the idea of offering a further promotional vehicle for the gas refrigerator and range.

The sink, cabinets, and other accessories of this new kitchen have been so designed that they will have identity, distinctive qualities, and utilitarian beauty all of which will work toward greater sales appeal for the two basic appliances.

N. E. Wooters
Sales Manager
Kitchen Accessories Division

In addition basic research has proved the desirability of increasing air circulation with a degree of filtration which will make the kitchen of the postwar home a better and cleaner place in which to work. Removal of steamy vapors and objectionable odors will be a feature of the Servel New Freedom Gas Kitchen which will add greatly to its sales appeal.

These features mentioned are just a few of which will make an attractive sales vehicle of the Servel Gas Kitchen. Research is continuing and many developments will be made which will be introduced at a later date.

Servel also announced at the same time a complete program of local promotion which will come along with the new kitchen design. This program will include a campaign portfolio which will be produced as soon as possible.

In addition, a training program will be provided which will cover sales, application planning, and installation and service to help gas companies promote the new kitchen. Another feature will be a series of display kitchens, and fixtures for setting up Kitchen Planning Centers in gas company salesrooms.

In announcing the formation of the new division Mr. Jones also announced the appointment of N. E. Wooters as product sales manager of Kitchen Accessories. Mr. Wooters, who formerly was in charge of the company's Multiple Housing Division, has had long experience in apartment house sales, government housing programs, and contacts with the building trades.

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RECENT COURT DECISIONS *Affecting Gas Utilities*

Review of Public Service Commissions' Law Suits

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

CONSIDERABLE discussion has arisen from time to time over the question: When and under what circumstances are rules and regulations by Public Service Commission valid?

Since the law on this subject is complicated, and presents variations, we shall review all important higher court cases decided during the past few months. By this method readers may readily apply respective decisions to their individual situations.

First, it is important to know that modern higher courts are resolved to *broadly* interpret the laws relating to various commissions.

On the other hand, the Public Service Commission is not required in administering the gas statutes to be absolutely accurate in its rules and orders. Moreover, while a court may hold a rule or regulation, issued by a commission, as invalid, the court cannot substitute its own or another rule or regulation.

For illustration, in Corzelius v. Harrell, 186 S. W. (2d) 961, reported June, 1945 it was shown that the Public Service Commission issued orders limiting production of natural gas from a certain field and providing for proration of production when it exceeded a specified quantity. The lower court canceled the orders and permanently enjoining the commission from entering any similar orders. The higher court reversed the lower court and upheld the commission. This court said:

"It is the duty of the commission to treat all interested parties justly and impartially, and the actions and rulings of the commission in attempting to accomplish such results will not be disturbed by the courts unless such rules or orders are clearly illegal, unreasonable, or arbitrary. The power to make rules rests exclusively with the commission. Courts may adjudge that a rule of the commission is invalid, but they can not substitute a new rule for the one adjudged invalid. . . . The judgment of the trial court is so broad in its terms that it would handicap if not make it impossible for the commission to make similar orders in the future."

Natural Gas Act

The Natural Gas Act was enacted to vest the Federal Power Commission with jurisdiction to regulate the transportation and sale of natural gas for re-sale in interstate commerce. This law was amended (see section 7(c) of the Act, as amended, 15 U.S.C.A. 717 f). The amendment requires companies desiring to engage in gas transportation, and those desiring to construct, extend, acquire or operate any gas facility to apply to the commission for a certificate of public convenience and necessity. Section 7(e) of the Act governs the issuance of certificates. It provides that a certificate *shall be issued* to any qualified applicant who is able and willing to perform the service proposed and to conform to the provisions of the Act. One of the provisions, of course, is that the public will be benefited by an issuance of a certificate and another is that the gas will not be "wasted."

According to a late higher court decision, under normal conditions, it is for the commission to draw the conclusion that the present or future public convenience and necessity either requires or does not require the granting of a certificate. Normally an order granting a certificate may be set aside *only* when the evidence shows only *one* conclusion: that its granting will not serve public convenience and necessity, or that the gas company is not in a position to supply the need.

For illustration, in Department of Conservation of Louisiana v. Federal Power Commission, 148 Fed. (2d) 746, reported May, 1945, it was shown that the Memphis Natural Gas Company on January 31, 1944, and on May 20, 1944, applied for certificates of convenience and necessity. The gas company desired to extend its gas service by the construction and operation of 62.5 miles of loop lines, and other extensions. The state Public Service Commission, and certain other interested corporations, objected to issuance of the certificates on the grounds that the gas company does not have adequate natural gas supplies to properly serve the public. Further it was contended that the gas to be withdrawn under the authority of the certificates will be put to an "economically wasteful use," since it will be burned under boilers.

The Federal Power Commission considered all testimony and rendered a decision granting the certificates. The higher court approved the decision, saying:

"The claim that the proof is insufficient to support the finding that the gas company has adequate supplies to enable it to properly serve the public interest may be disposed of in short order by saying that the record amply supports the commission's finding both that there was a public need to be served and that the applicant for the certificates showed itself adequately equipped to perform it."

For late and leading higher court decisions involving validity and application of the Natural Gas Act, see Illinois Natural Gas Company v. Central Illinois Public Service Company, 314 U. S. 498; Natural Gas Pipeline Company v. Federal Power Commission, 315 U. S. 575; Public Utilities Commission v. United Fuel Gas Company, 317 U. S. 456; and Federal Power Commission v. Hope Natural Gas Company, 320 U. S. 591.

Obviously, when any commission renders a decision preponderated against the law and evidence, the higher court may revoke or modify the decision.

See the late and leading higher court decision of Williamson v. Public Service Commission, 174 S. W. (2d) 526. The testimony in this case showed that a gas corporation was organized for the purpose of procuring, transporting and distributing natural gas to consumers. One important question presented the court was whether the commission had properly decided that the Land Gas Company had pursued a course of furnishing natural gas to the public generally for domestic purposes, as well as to commercial institutions. Also, another question presented the court was whether the Public Service Commission had properly and legally ordered that another gas company engaged in distributing gas to domestic consumers connect its pipes with those of the Land Gas Company.

The higher court upheld the commission's decision and stated that the evidence sustained such decision.

Also, see Gulf Company v. Atlantic, 131 S. W. (2d) 73. In discussing the power conferred on the Public Service Commission by the State Legislature, this court said:

"Under our gas conservation statutes 'Any interested person affected . . . by any rule, regulation or order made or promulgated by the commission thereunder . . . shall have the right to file a suit in a court of competent jurisdiction . . . to test the validity of said laws, rules, regulations or orders'."

This court also explained:

"The commission must of necessity ascertain facts and make fact findings. Of course, such fact findings may be made either expressly or by implication."

Data Lacking

Modern higher courts consistently hold that failure of a city to file complete data to enable either a Public Service Commission, or a court, to determine *all* issues in the litigation entitles the company to a favorable verdict.

For illustration, in City of Ludlow v. Union Light, Heat and Power Company, 186 S. W. (2d) 640, reported May, 1945, it was shown that a city filed a suit and asked the court to compel a gas company to furnish gas to its inhabitants at the same rate which the company supplied gas to consumers in other nearby cities, and to require the company to refund to the consumers within the city all charges in excess of the rates at which it furnished gas to consumers in such other nearby cities.

However, since the city failed to supply the court with full and complete data, including its ordinance accepting the gas company's bid to supply gas to its consumers, the higher court refused to hold in favor of the city.

Conversely, all gas companies which file suits, within jurisdiction of the Public Service Commission or the Public Utility Commission, are legally duty bound to supply the commission with all relevant facts, otherwise the company cannot expect a favorable verdict.

See Chenoweth v. Railroad Commission, 184 S. W. (2d) 711, reported March, 1945. In refusing to render a verdict favorable to a company which sued for revocation of a commission's order, the higher court said:

"It was incumbent upon them to allege the factors prescribed by the statute for commission guidance. This their petitioner wholly failed to do."

Appeal Date

The same law is applicable to proceedings for reorganization of gas corporations. In other words, all facts, testimony and other data must be presented for full consideration of all commissions and courts to which an appeal is taken.

For instance, in Elias v. Clarke, 143 Fed. Rep. (2d) 640, reported August, 1944, the suit involved the reorganization of Associated Gas and Electric Company. The controversy arose because of a difference of view as to the legality of an option to the company for conversion of bonds known as Convertible Debenture Certificates into preferred stock. It was contended that the option was void because it was reserved to the company, and not to the holders of the bonds.

Among other things the higher court held that a decision rendered by the lower tribunal must be sustained, if the testimony showed that all of the evidence considered by the lower court was not presented the higher court to which an appeal was made.

Wage Disputes

Another important element of law relating to authority of commission involve payment of wages under the Fair Labor Standards Act.

For illustration, considerable legal discussion has arisen in the past over the answer to the legal question: When is a truck driver employed by a gas company entitled to wages specified by the Fair Labor Standards Act?

In Guthrie v. Emmons, 12 Ohio Supp. 45, Ohio, it was disclosed that the driver of a motor truck hauled products in interstate commerce. He sued his employer to recover wages for overtime, liquidated damages and attorney's fee under the provisions of the National Fair Labor Standards Act.

The higher court refused to hold the employer liable because the Interstate Commerce Commission had the power to fix hours of service of this truck driver. Under such circumstances the Fair Labor Standards Act is not applicable, so held this higher court.

But in Farris v. Same, 12 Ohio Supp. 46, Ohio, a higher court held that all truck drivers are entitled to wages specified by the Fair Labor Standards Act if such driver operates a motor truck *wholly* within the state.

This higher court explained that this driver transported products exclusively in a single state and, therefore, he was *not* within jurisdiction of the Interstate Commerce Commission. However, the court held that all truck drivers, who perform the final act of *delivering* merchandise shipped in interstate commerce are within provisions of the Fair Labor Standards Act, since this Act includes all employes engaged in producing, processing or handling goods in interstate commerce.

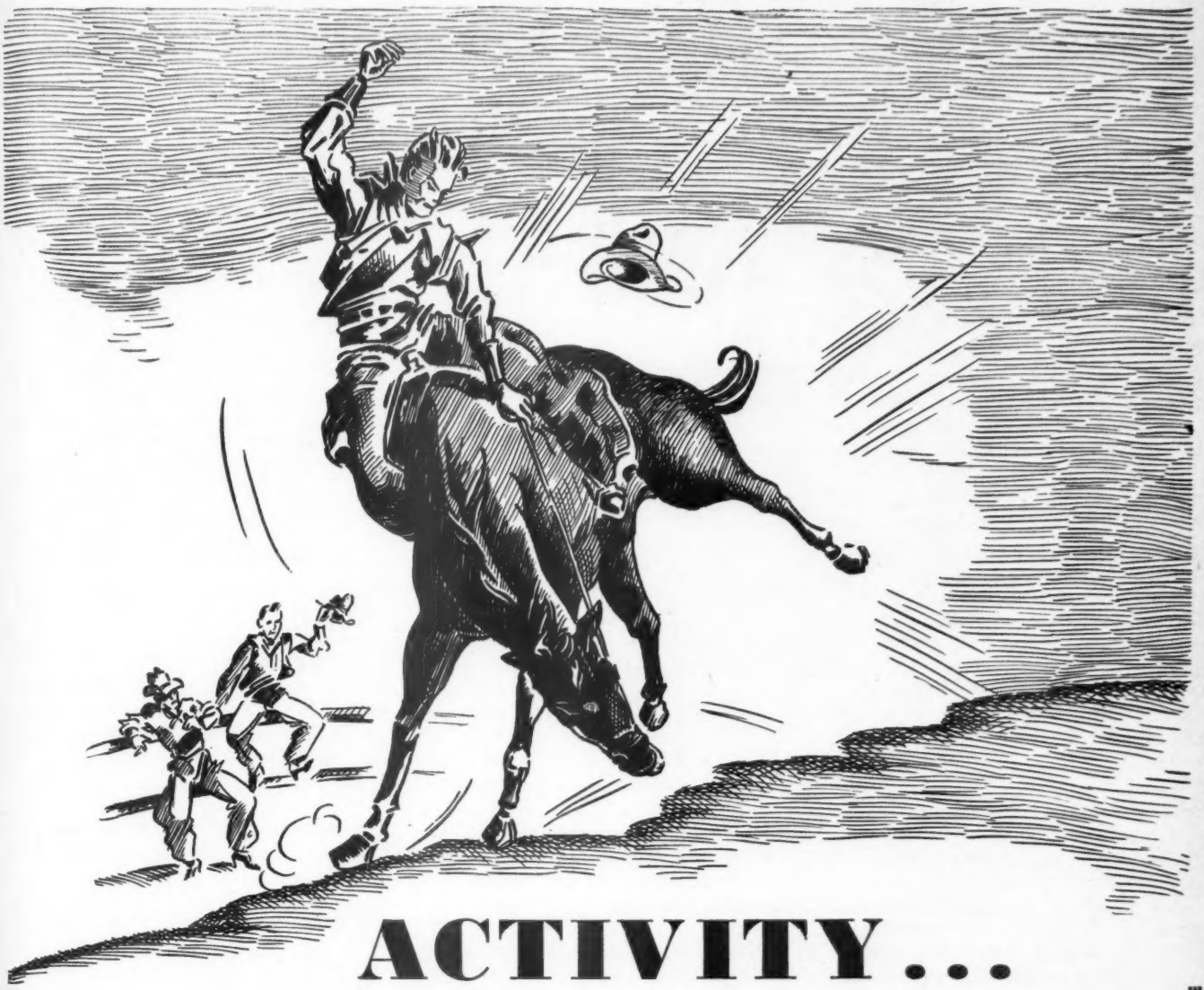
FPC Will Hold Hearing Oct. 15th re—Construction 825 Mile Pipe Line

The Federal Power Commission will hold a public hearing beginning at 10 a.m., October 15 in the Commission's hearing room, 1800 Pennsylvania Avenue, N. W., Washington, D. C., on the Metropolitan Eastern Corporation's application for a certificate of public convenience and necessity authorizing it to construct and operate approximately 825 miles of 18-inch natural gas transmission pipeline extending northeasterly from the Carthage Field, Panola County, Texas to a point near Hamilton, Ohio.

The pipeline, with appurtenant facilities, including five compressor stations having an aggregate of 25,600 horsepower, and a dehydration plant, is estimated to cost $23,500,000. The project would have an initial daily capacity of 140 million cubic feet of gas, intended to be sold to distributing companies in Ohio.

Metropolitan Eastern is a new corporation, organized under the laws of Delaware.

Interested State commissions may participate in the hearing as provided under the Provisional Rules of Practice and Regulations under the Natural Gas Act.



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Tests Performed to Determine Hazards In Welding on "Hot Lines"

By
Ralph Nabors,
Pacific Gas and Electric Company

THE TESTS performed were made to determine, if possible, hazards present in welding on "Hot Lines." Realizing that there is always the possibility of burning through when welding of this kind is performed it has been a question in many minds as to the repercussions to be expected.

A wide range of practice exists in different organizations and branches of organizations. The divergence is so great that little actual factual information is obtainable.

The tests were made on a test specimen constructed of 6" pipe with an average wall thickness of .1875 and 10" pipe with an average wall thickness of .264.

One end of the test specimen was attached to the gas main and the other end was piped with a vent. As near actual flow conditions, at various pressures, as possible were maintained during the tests.

The first series of tests were designed to determine the factors involved in welding, by the oxy-acetylene method, on lines of given wall thickness through a range of pressures.

The first test was made by welding a ½" nipple on a 6" pipe under 5 psi pressure. For this test a #4 welding tip was used. The oxygen setting was 12 lbs. The weld was completed without penetrating the line. However a quite noticeable deformation of the pipe interior existed.

The second test was made by welding a 2" nipple on a 6" pipe under 5 psi pressure. For this test a #4 welding tip was used. The oxygen setting was 12 lbs. The pipe wall was penetrated when the weld was about half completed. No fire occurred from the penetration and the hole resulting was approximately 1/16" diameter. This hole was welded over and the test continued. Another penetration occurred resulting in a hole 5/64" diameter. No fire occurred on this occasion. Noticeable deformation was present on interior of pipe wall.

Pressure was now raised to 50 psi and a ¾" nipple welded on the 6" pipe using a #5 welding tip, 12# oxygen pressure. The weld was completed with no penetration although quite noticeable deformation of the pipe interior occurred.

A final test was made by welding a ¾" nipple on the 6" pipe pressured at 100 psi. A #5 welding tip, 12# oxygen pressure was used. Penetration occurred as the weld was being completed. The hole resulting was less than 1/16" diameter; however the deformation of metal on the pipe interior was such that the wall thickness at the point of penetration was only 1/16". A fire occurred momentarily but blew itself out.

Three tests were made on 10" pipe, two with oxy-acetylene and one with the arc method. These welds were made on pipe pressured at 200 psi. In no case did penetration occur and pipe wall deformation was less noticeable than on the 6" pipe specimen.

These tests would tend to confirm the theory that the pipe wall thickness, rather than pressure is to a large degree the controlling factor limiting welding on "Hot Lines."

A comparison was made between arc and oxy-acetylene welding on a piece of open end 6" 3/16" wall pipe. No noticeable color was observed during the arc welding process. While the oxy-acetylene weld was being performed the inside pipe wall became a bright cherry red and at times had an appearance of being almost molten.

Since it is known that penetration from oxy-acetylene welding is as great as 5/32" it seems reasonable to assume that penetration on pipe with a wall thickness of 3/16" or less may occur at any pressure.

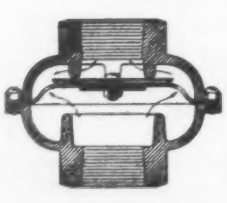
Penetration tests were made on 10" and 6" pipe at a pressure of 5 psi. A #6 welding tip with 12# oxygen pressure was used to melt the metal. No fire occurred as a result of the penetration. The holes blown out were less than 1/16" diameter. Penetration tests were then made with pressure raised to 100 psi. No fire occurred and the result and holes compared favorably with the holes in the specimen at 5#. Penetration tests were made at 230 psi and the results compared favorably with tests at lower pressure.

It is very apparent that the welder is the greatest factor in successfully welding on "Hot Lines." The welder used for these experiments was not an experienced man on this particular tvpe of work. No doubt with practice, a welder would become proficient to such an extent that failures would be very few.

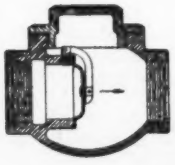
There seems to be very little possibility of penetrating a pipe while welding to such an extent that gas escapes in large volume. The possibility of fire is remote but may occur at any pressure at a distance from the opening when diffusion with air has occurred and the velocity of the gas does not exceed the flame speed of the gas.

Presented at Pacific Coast Gas Assn. Conference on Accident Prevention, San Diego, May 16-17, 1945.

Pressure Controls for Gas and Air



HORIZONTAL
DIAPHRAGM
CHECK VALVES
DISC
VERTICAL



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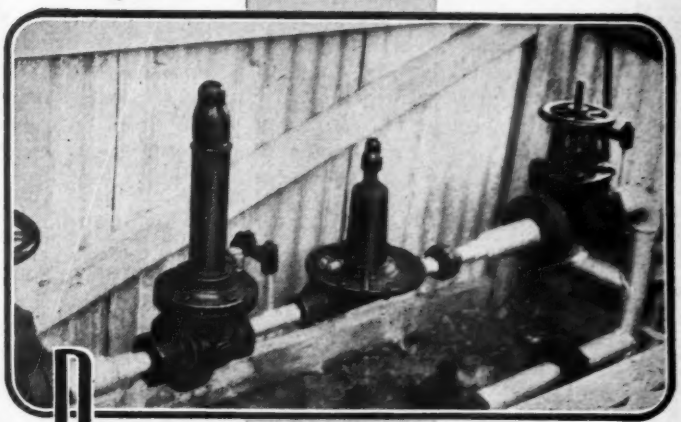

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Value of Contests in Safety Promotion

By

Geo. E. Lewis,
Portland Gas and Coke Company

LAST YEAR was the biggest year the Production Bureau of the Portland Gas & Cake Company has ever had if you measure it by accomplishments in the field of safety or accident prevention.

Based upon manhour exposure, the accumulated accident frequency rate dropped 47 per cent in 1944 from that of the preceding year of 1943 and 60.47 per cent since the end of 1942. This reduction was made in the face of increased manhours, stepped up production schedules and rapid labor turnover, all of which have a tendency to increase accident frequency.

Likewise, the severity rate or the number of production days lost as a result of occupational injuries was lowered during the past year 54 per cent under the previous experience accumulated in 1943 to an all time low of 0.43 days lost per thousand manhours. Since 1942 the severity figure has dropped 69.3 per cent.

Two outstanding records have been made by two of the divisions within this plant, both of which are usually considered hazardous occupations when based upon national experience. These records were created when a twenty man construction crew completed 19 months without a disabling injury and the Laboratory crew of 14 persons completed 20 months without an injury other than first aid cases.

Behind this outstanding reduction of manpower waste was the inauguration in 1943 by the company of a comprehensive management sponsored safety program headed by a full time Safety Engineer, but including every member of the organization from top management down.

The program has an eleven point basis:

1. Management backing and interest.
2. Supervisory advice, cooperation and investigation of accidents.
3. A safety department acting in advisory and coordinating capacities only.
4. Elimination of physical and mechanical hazards.
5. A strong Safety Committee organization.
6. An active safety educational program.
7. Quarterly safety contests among various crews.
8. Company sponsored eye Safety program with corrective safety type glasses.
9. Group safety meetings for employees.
10. Medical and first aid attention to reduce accident severity.
11. Encouragement of employee suggestions pertaining to unsafe practices and unsafe conditions.

One of the most effective instruments for the promotion of safety has been the Plant Safety Committee which is comprised of: Superintendent, Engineers, all supervisory forces and one representative from each division of the plant who serves for a period of three months. This committee meets monthly for study, discussions, and recommendations and is most effective in creating safety-consciousness among all employees and acting as a clearing house for employee suggestions.

The greatest amount of effort by the Safety Department has been placed upon the Educational portion of the program through the following mediums:

1. Accident investigation, at which time the supervisor is drawn into the picture. They thus learn why their employees get hurt and how it could have been prevented.
2. Safety Committee meetings. Sound slide films, Foreman safety training films, guest speakers, etc., are all used to instruct and create an interest in safety and preventing accidents.
3. Group Safety Meetings held by the foreman for his crew at which time safe practices are discussed and suggestions offered by workmen for prevention of accidents. These meetings have been very successful and are held regularly every two weeks.
4. Use of bulletin boards for posting of safety posters and bulletins on health, safe practices and off-the-job safety.
5. Personal contacts with all employees to discuss various aspects of safety with a continual reminder that "Safety Always Pays."
6. Safety contests to promote a competitive spirit and create a desire to prevent accidents to others as well as one's self.

Another part of the formulated plan to prevent injuries and help promote safety consciousness was the Eye Protection program by which each employee wearing prescription eye glasses was able to secure the

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"B" TYPE METERS
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High in efficiency . . . low in cost. In hundreds of plants throughout the country, Connelly Iron Sponge has proven itself . . . the finest purification material on the market. Not only does it lower your purifying cost but its high activity and capacity tends to reduce distribution and service complaints because of the cleaner gas which ultimately lowers operating and maintenance costs.

If you have a problem in gas purification, Connelly's 68 years of experience is at your service. Our engineers can help you . . . there is no obligation on your part.

CONNELLY IRON SPONGE & GOVERNOR CO.
ELIZABETH, N. J. LOS ANGELES, CALIF.
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same correction in industrial safety glasses, thus gaining not only correct vision but eye protection at all times as well. Part of the expense for these glasses have been borne by management, making individual costs very low. Approximately 75 per cent of all persons needing corrective lenses have taken advantage of this offer and are now wearing corrective vision safety glasses. Since inauguration of this part of the program eye injuries have decreased 80 per cent under previous figures. Likewise, improvement has been noted in worker morale, and efficiency which is directly traceable to improved vision through scientific refractioning of the eyes and adaptation of corrective vision consistent with the particular occupational needs of the individual workman. There is also a comforting knowledge that this type of lens is practically unbreakable, which has a psychological effect upon the individual and helps to create safety consciousness.

Beginning in January of 1944, a continuing series of quarterly Safety Contests were inaugurated with the express purpose of arousing a competitive spirit and creation of individual safety consciousness. To say that these contests have been successful is putting it mildly, for they have brought results far beyond expectation. The entire personnel of the plant with the exception of the Administration force, have been divided into nine teams headed by the respective foremen, varying in size from fourteen members to sixty. Standing in the contest is determined by that team or teams having the lowest accident frequency rate based upon manhours of exposure. In the event that more than one team finishes a contest period without suffering a lost time accident, the team with the greatest number of manhours of exposure wins.

Cash prizes in the form of War Savings Stamps are offered by the management to each member of the winning teams as follows:

1. First Prize, a $5.00 War Saving Stamp to each member of the winning team.
2. Second Prize, $2.50 in Stamps to each member of the second place team.
3. Third Prize, $1.00 in Stamps to each member of all other teams that have completed the contest period without a lost time accident.

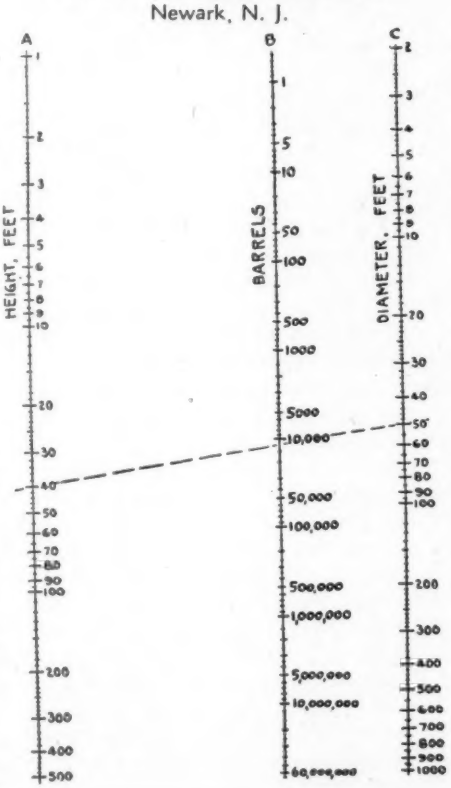
It is management's belief that this expenditure of prize money has done more to further the Safety program than any other expenditure and is fully justifiable. The standings and accident experience of all teams are kept currently posted upon an outdoor fully illuminated bulletin board centrally located within the plant area. This serves as a continual reminder of *Safety* and the need for its use twenty-fours hours of the day.

These features coupled with many others are doing their part in the elimination of needless accidents for the benefit of every one.

Presented at Pacific Coast Gas Assn. Conference on Accident Prevention, San Diego, May 16-17, 1945.

Barrel Capacity of Circular Tanks

By
W. F. Schaphorst, M.E.
Newark, N. J.



The writer has used 50 gallons per barrel as the standard for the accompanying chart. In the event that your barrel standard is different, the chart is still applicable by using a simple correction factor.

Run a straight line across it connecting the height of the tank with its diameter and the volume in barrels is found in the central column, Column B.

For example let us say that we have a vertical cylindrical tank 50 ft. in internal diameter and 40 ft. high. How many barrels will the tank hold?

Run a straight line through the 40 in column A and the 50 in column C as indicated by the dotted line. The intersection of that line with column B then shows us that the tank will hold about 12,000 barrels.

The chart can be applied to your barrel standard by following this rule: Divide 50 by *your* barrel standard and multiply the quotient by the result found in column B. The product, then, is the correct number of barrels.

Thus for example let us say that *your* barrel contains only 32 gallons, which is a standard that is commonly used. How many such barrels will the above tank hold? Dividing 50 by 32 we get 1.56. Then, multiplying 12,000 by 1.56 we get 18,720 barrels.

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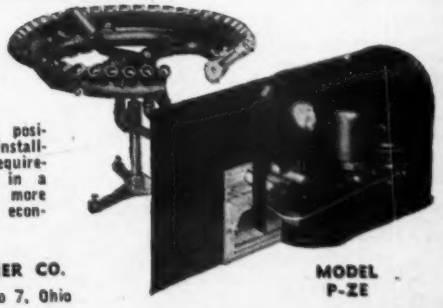
NU-TYPE ductless burner that performs perfectly with natural, manufactured or mixed gas.

Popular with scores of utilities and thousands of home owners. Simplifies problem of converting to gas. Tamperproof controls, quiet operation, high efficiency, positive performance. Easily installed. Negligible service requirements. Each installation in a neighborhood sells many more because of its simplicity, economy and ease of control.



COLUMBIA BURNER CO.
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MODEL P-ZE

F. P. C. Natural Gas Investigation

THE Federal Power Commission announced July 1st that hearings will be held in its fact-finding investigation into the conservation and utilization of natural gas in the principal gas producing and consuming areas beginning with one scheduled for Kansas City on September 18, to be followed by a second hearing in Oklahoma City on October 9 and a third in New Orleans on October 30. Dates will be announced later for the hearings to be held in Texas and other producing areas and in certain consuming centers.

As an aid to development of the most useful and systematic record on all relevant matters the commission states that it seems desirable to circulate as a guide to those who may participate in the hearings a provisional outline of the subject matter intended to be covered in the investigation. The outline, it is pointed out, is based largely on suggestions received from various interested persons in response to the Commission's request and is not intended to preclude the consideration of any other aspects of the problem which may also be important.

Under the general heading "Reserves" the Commission lists the following suggested subjects: (a) proven reserves of recoverable gas; (b) recent important discoveries and prospects for future discoveries; (c) factors involved in probable life calculations, and (d) life history of typical outstanding fields which have been abandoned or greatly depleted.

The second major subject is "Practices and Problems as Related to Production for Interstate Commerce" and is subheaded: (a) technical factors related to peculiar properties of natural gas; (b) special problems in the production of casing-head gas; (c) data, by years, on gross production and marketed production; (d) development of coordinated practices in production; (e) effects of taxation on gas, gas producing facilities and lease-holds, and (f) field prices in relation to production.

Under the topic of "Extent and Control of Physical Waste," the outline suggests that evidence be presented on: (a) kinds of waste; (b) extent of physical waste, and (c) remedial measures—accomplishments and further steps to be taken.

"State Laws Governing Production, Waste and Conservation," is the fourth major subject to be taken up and it is suggested that material be offered on (a) history of control statutes by the States; (b) recent developments and present situation as to State conservation legislation and its administration and (c) legislative history, activities and accomplishments of the Interstate Oil Compact Commission.

On July 7th, Chairman Basil Manly of the Federal Power Commission announced that an extended conference was held July 6th with representatives of the Independent Natural Gas Association of America, who were accompanied by representatives of the petroleum industry. The conference was requested by Mr. E. Buddrus, INGAA President, for the purpose of discussing matters in connection with the Commission's current natural gas investigation.

The principal item of discussion was the outline of procedure and topics to be covered in the investigation, which was issued on June 20. During the conference, general understandings were reached regarding the presentation by the natural gas and oil interests of testimony at the FPC hearings scheduled to begin on September 18, 1945 in Kansas City, Missouri.

In addition to Chairman Manly, those attending the conference were Vice Chairman Leland Olds and Commissioner Nelson Lee Smith; Messrs. E. Buddrus, W. E. Disney, John A. Ferguson, W. H. Wildes, and Joseph Bowes representing the INGAA; Judge J. C. Hunter of the Interstate Oil Compact Commission; Mr. W. R. Boyd of the Petroleum Industry War Council and the American Petroleum Institute; and Mr. Russell Brown of the Independent Petroleum Association.

The Board of Directors of the Independent Natural Gas Association of America has taken action designed to procure for the royalty owners and producers of natural gas the widest possible market for their commodity.

In a resolution adopted by the Board, June 29th, it is stated that the INGAA will dedicate its principal efforts at this time to making possible the maximum use of the only means of transportation available to natural gas, namely, pipelines, "so that the royalty owners and producers may obtain the widest possible market for their product and the States may carry out effective policies of conservation in respect to natural gas."

The resolution follows—

Whereas oil has a world market and uses all means of transportation — highways, railroads, tankers, barges and pipelines while natural gas coming from the same sources as oil has only one means of transportation, namely, pipelines, and whereas according to the testimony given before the O'Mahoney Committee of the United States Senate June 19, 1945, by Dr. E. DeGoyler on gas reserves and J. Edgar Pew on oil reserves, there are in excess of 140 trillion cubic feet of known gas reserves and in excess of 20 billion barrels of known oil reserves, and the quantity of gas reserves in relation to consumption of gas is nearly 2½ times as great as the oil reserves in relation to the consumption of oil, and because of the lack of transportation royalty owners and producers of natural gas are deprived of proper markets for their product, be it resolved that the Independent Natural Gas Association of America dedicate its principal efforts at this time to obtaining an Amendment to the Natural Gas Act so as to make possible the maximum use of the only means of transportation available to natural gas, namely, pipelines, so that the royalty owners and producers may obtain the widest possible market for their product and the States may carry out effective policies of conservation in respect to natural gas.

Cities Service Gas Co. Expansion Plans

S. B. Irelan, president of the Cities Service Gas Company, with headquarters in Oklahoma City, announced recently that the Cities Service Company, the parent company, has authorized the expenditure of nearly one million dollars which will increase the domestic gas supply for the Kansas City area by January 1.

Mr. Irelan stated that the actual amount to be expended will be approximately $900,000.

Most of the amount will be spent on additional capacity for the Welda, Kans., compressor station and thirty-one miles of 20-inch pipe line extending from that storage field.

Benefits of increased supplies of domestic gas for peak days will be extended to Kansas City and St. Joseph in Missouri, and to Kansas City, Kansas and Topeka.

Gas Holder Purged and Repaired By Novel Method

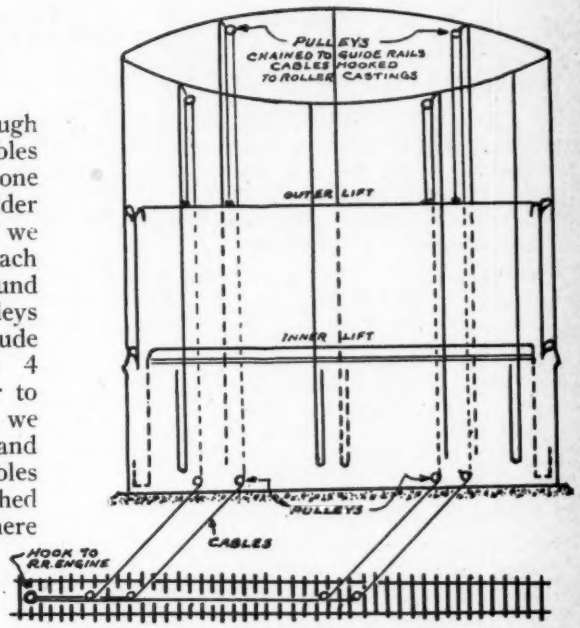
By
Arthur J. Smith.
Gas Engineer
Chicago, Ill.

WE EMPLOYED some novel methods in holder cleaning and in reconstruction of an entire new outside lift on a 200,000 cu. ft. 2-lift gas holder, at a plant which I managed, where the sendout was 1,500,000 cu. ft. daily. The outside lift was so badly pitted that it was either a case of putting in a new one or abandoning the holder entirely.

We first put in a syphon of gas pipe leading over the bench and almost down to the bottom of the holder, and down to the bottom on the outside of the holder. Then we plugged the bottom of the syphon and filled the outside pipe from a plugged Tee at the top. Then by removing the bottom plug, the syphon started, running all night. The holder was empty of water about 9 A.M. the following morning. All gas was also removed.

Next we removed the bonnet plates over both riser inlet and outlet of the holder on top, and turned in high pressure air for several hours, until the gas fumes were removed, then put in a ladder and had a man go in with a gas mask which had high pressure air reduced, attached to the gas mask, the air blowing through the mask, and out on all sides, leaving no chance for gas to get to or in the mask. We then took off a sheet from the top of the holder and had one man above with a rope and pail, and another at the bottom of the holder with a mask on air connection, filling the pail until the slush was all removed.

Four large pulleys were hooked to the top guide rails of the holder with heavy chains, and through these we ran heavy cables down and attached each one of them to a separate holder guide roller frame. Then we brought the other ends of each 4 cables down to the ground through 4 more pulleys chained to bottom holder giude rails, and carried these 4 cables about 100 feet over to our railroad switch which we used for unloading coke and oil. We ran these same cables through other pulleys attached to the railroad track where they were made ready to attach to a railroad engine.



We had made arrangements with the railroad company to bring in one of their 50 to 100 tons freight engines, and attached these cables to it. As it moved slowly ahead we hoisted the outside holder lift clear to the top of the guide rails carrying the upper lift with it and chained it to the top of the guide rails. Then we set the millwrights to work taking out one sheet at a time from the holder and laying each sheet on a new plate sheet, cutting it to size and drilling it to location of rivet holes, and then riveting it back in place of the old sheet, until we almost built a new holder lower lift.

One man bucked up rivets on the inside and another used the riveting air hammer on the outside. The man on the inside by that time had open sheets enough so that by watching there was but little need for the gas mask. We put the holder back in commission and it worked like a new holder. There was no tar oil in this holder. No oil was used, as it carried blue water gas.

Judging from the success of the entire operation as well as the ease in raising and letting down the holder with the engine, it seems that this method could be used with a holder of larger size. The drawing herewith shows method of connecting pulleys, two of them being on the opposite side of the holder so that lifts rose evenly.

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GAS HOLDERS
Low Pressure High Pressure Inspection
Purifiers Tanks Flues Etc.
Over 40 Years of Sound
Steel Plate Construction

News of the Gas Industry

A. G. A. Activities

Nominating Committee of A.G.A. Presents Report

Announcement has been made to the membership of the American Gas Association of the following report of the General Nominating Committee which will be presented at the Annual Meeting:

For President—E. J. Boothby, Vice-President and General Manager, Washington Gas Light Company, Washington, D. C.

For First Vice-President—R. H. Hargrove, Vice-President, United Gas Pipe Line Company, Shreveport, La.

For Second Vice-President—Hudson W. Reed, President, The Philadelphia Gas Works Co., Philadelphia, Pa.

For Treasurer—Edward F. Barrett, President, Long Island Lighting Company, Mineola, N. Y.

For Directors—Two-year terms:

J. French Robinson, President, The East Ohio Gas Co., Cleveland, Ohio.

R. E. Fisher, Vice-President, Pacific Gas & Electric Co., San Francisco, Calif.

Walter C. Beckjord, Vice-President and General Manager, Columbia Gas and Electric Corp., New York.

C. M. Cohn, Chairman of Board and President, Consolidated Gas, Electric, Light & Power Co. of Baltimore, Baltimore, Md.

E. H. Eacker, Vice-President, Boston Consolidated Gas Company, Boston, Mass.

J. N. Greene, President, Alabama Gas Company, Birmingham, Ala.

H. E. Handley, President and General Manager, Handley Brown Heater Co., Jackson, Michigan.

D. A. Hulcy, President, Lone Star Gas Company, Dallas, Texas.

Henry E. Morse, Vice-President, Florence Stove Co., Gardner, Mass.

E. P. Noppel, General Consultant, Ebasco Services Incorporated, New York, N. Y.

Clifford E. Paige, Chairman of Board and President, The Brooklyn Union Gas Company, Brooklyn, N. Y.

E. J. Tucker, Director and General Manager, Consumers Gas Co. of Toronto, Ontario, Canada.

Respectfully submitted,

ERNEST R. ACKER, *Chairman*
GEORGE S. HAWLEY
R. E. WERTZ
T. J. STRICKLER
F. S. WADE
LYLE C. HARVEY

Section Nominations

The following have been nominated by Section Nominating Committees to serve as Section officers for the next Association year:

Accounting Section: For Chairman—E. F. Embree, General Auditor, New Haven Gas Light Company, New Haven, Conn. For Vice-Chairman—Leith V. Watkins, Secretary-Controller, Panhandle Eastern Pipe Line Company, Chicago, Illinois.

Industrial & Commercial Gas Section: For Chairman—Harry A. Sutton, Asst. Gen. Ind. Fuel Rep., Public Service Electric & Gas Company, Newark, N. J. For Vice-Chairman—Karl Emmerling, Asst. Gen. Supt., The East Ohio Gas Company, Cleveland, Ohio.

Manufacturers Section: For Chairman—Frank H. Adams, General Manager, Surface Combustion, Inc., Toledo, Ohio.

Publicity & Advertising Committee: For Chairman—C. A. Tattersall, Niagara Hudson Power Co., Syracuse, N. Y.

Residential Gas Section: For Chairman—J. J. Quinn, Sales Manager, Boston Consolidated Gas Company, Boston, Mass.
For Vice-Chairman—Wallace M. Chamberlain, Sales Manager, Michigan Consolidated Gas Company, Grand Rapids, Mich.

Technical Section: For Chairman—Lester J. Eck, Vice-President, Minneapolis Gas Light Co., Minneapolis, Minn.
For Vice-Chairman—C. S. Goldsmith, Engineer, Distribution, The Brooklyn Union Gas Co., Brooklyn, N. Y.

A.G.A. Domestic Range Committee Plans "CP" Promotion for Dealers

A complete "CP" dealer promotional program designed to assist dealers in selling a greater volume of higher grade gas ranges postwar was put into final form by the Interim Committee of the A.G.A. Domestic Range Committee, held in New York June 27th and 28th. Consultants to the group were representatives of Hardware, Department Stores, Furniture, Appliance, and L-P Gas Dealers.

In addition to a complete coordinated sales plan, basic recommendations for action on the part of manufacturers and gas utilities included regional dealer meetings, revival of the "CP" Ranger Club and the "CP" Ranger News. More than 8,500 gas range salesmen participated for prizes in the "CP" Ranger Club prewar.

A complete sales training course designed to train new salesmen and to bring older salesmen up-to-date on the latest sale's techniques will be available. Each manufacturer will augment the sales training programs with his own sales and product stories.

In the recommendations were included plans for close dealer utility cooperation. Major promotional efforts will be directed at clock control gas ranges built to "CP" standards.

The Interim Committee was composed of Mr. Wallace M. Chamberlain, who represented gas utilities; Lloyd G. Ginn, Promotion Manager of American Stove Company, representing manufacturers; Frank Williams, Secretary A.G.A. Residential Section and James I. Gorton, A.G.A.E.M. "CP" Promotional Director. The L-P gas industry was represented by Ross Roberts, Pyrofax Division of the Carbide and Carbon Chemicals Corp.

Looking at the new "CP" dealer kit are L. C. Ginn, American Stove Company, and Vice-Chairman of the Committee; W. M. Chamberlain, Chairman A.G.A. Domestic Range Committee; Ross Roberts, Pyrofax Division, Carbide & Carbon Chemicals Corp., representing L-P Gas; F. W. Williams, Secretary Residential Section A.G.A. and James I. Gorton, A.C.A.E.M. "CP" Promotional Director.

N.E.G.A. Announces Five-Day Home Service Conference

President D. S. Reynolds of The New England Gas Association has announced that 23 speakers have accepted invitations to lecture at the Home Service Development Conference which will be held in Boston for five days from September 17-21.

This conference, the most comprehensive home service course ever presented in this country, will cover subjects from gas making through to food making.

The lecturers have been obtained from gas utilities, gas trade associations, home economics schools, women's magazines, radio broadcasting stations, newspapers, appliance manufacturers, food manufacturers, food trade associations and chain food stores. The speakers are compiling texts to be included in loose-leaf books which will be issued to the home service representatives who attend the conference.

Several appliance manufacturers have indicated their willingness to have exhibits at the conference.

Mrs. Lillian P. Dunbar of Cambridge, past chairman of the NEGA Home Service Group, has been the chairman of the committee arranging the conference. The Chairman of the Home Service Group is Miss Susan A. Mack of Boston while the Chairman of the Sales Division is Robert E. Finnin of Boston. Mrs. Hazel Cheever of Malden, immediate past chairman of the NEGA Home Service Group, has been the chairman of a subcommittee which has played an active part in arranging various conference details.

In announcing the September conference, President Reynolds commented as follows:

"The proposed Home Service Development Course is workable and sound in its conception. In developing the course, the committee scrutinized each phase of the training course to ascertain that it was the most appropriate for a proper realization toward establishing home service on an even sounder footing than at present. The attached program follows many months of work and conferences by the committee members."

Ample opportunity will be allowed at the conference, which will be held in the auditorium of the Boston Consolidated Gas Company, for a discussion of the remarks of the various speakers.

American Gas Association to Hold Annual Meeting on October 24th

The Twenty-Seventh Annual Meeting of the American Gas Association will be held on October 24, 1945, at the auditorium of the Engineering Societies Building, 29 West 39th Street, New York.

To impose a minimum burden on transportation facilities which are needed for the armed forces and to obviate need for hotel accommodations, the Association again will limit its yearly convention to a one-day meeting.

Officers will be elected at the general membership meeting in the morning and committee chairmen will read reports covering the activities of their sections during the past fiscal year. The luncheon meeting and the remainder of the day will be devoted to organizational work by departments and committees.

Sorenson Elected President Indiana Service Corp.

C. V. Sorenson

Mr. C. V. Sorenson was elected president and a director of Indiana Service Corporation, Fort Wayne, Indiana, by the board of directors. Mr. Sorenson has been new business advisor of Indiana Service Corporation and the Northern Indiana Public Service Company.

He is a past president of the Indiana Gas Association and formerly served as chairman of the Residential Section of the American Gas Association. Mr. Sorenson was a member of the American Gas Association Postwar Planning Committee and chairman of the Sub-committee on Postwar Purchasing Power & Potential Markets.

Duncan, General Manager, Florida Power Corp.

Buell G. Duncan has been named general manager of the gas division of the Florida Power Corporation, as announced by A. W. Higgins, President. Mr. Duncan has been with the company and its predecessors since 1925. His headquarters are at Orlando, Fla. Mr. Duncan is Secretary of the Gas Meters Association of Florida-Georgia.

These Bonds were placed privately with certain institutions purchasing them for investment. $12,930,000 of the Bonds were placed by the undersigned and $925,000 by the Company. They are not offered for sale and this announcement appears as a matter of record only.

$13,855,000

Washington Gas Light Company

Refunding Mortgage Bonds

3⅛% Series due 1970

The First Boston Corporation

July 26, 1945

F.P.C. Authorizes Construction of New Pipe Line

The Federal Power Commission has authorized the United Gas Pipe Line Company to construct at an estimated cost of $7,261,221 a 24-inch pipeline extending east 143 miles from the Carthage field in Texas to a point of connection with the Tennessee Gas and Transmission Company's existing main 24-inch line at Monroe, Louisiana, and from there to a connection with United's existing facilities in the Monroe gas field, about 4½ miles of 18-inch line beginning at the Chicago Corporation's gasoline plant in the Carthage field and connecting with the proposed 24-inch line, and appurtenances. United is authorized by the FPC certificate to operate the facilities, which will have a daily capacity of 310,000,000 cubic feet of gas, to transport for the Tennessee company a maximum of 114,000,000 cubic feet of gas a day from the Carthage field to Tennessee's Monroe compressor station, and to transport during the war emergency period a maximum of 65,000,000 cubic feet per day for service to United's present customers. The determination of the amount to be transported to serve United's customers after the war emergency period is reserved for consideration in the light of the circumstances then existing. Vice Chairman Olds wrote a separate concurring opinion.

"Big Inch", "Little Big Inch" Pipe Lines

There is still no indication from any official source in Washington as to what will be the eventual plan for disposing of the "Big Inch" and "Little Big Inch" pipe lines. It has been thought that the Surplus Property Board might have come up with some suggested plan for disposing of these pipe lines by now, but in its second quarterly report, just transmitted to Congress, the Board explained that because of the pressure of other matters and the delay that has attended its organization, it has not yet had opportunity to explore that matter thoroughly enough to formulate a suggested plan for disposition of these lines. Under the Surplus Property Act, the Board is called upon to make recommendations to Congress for disposing of these pipe lines.

Since the Chairman of that Board, former Senator Guy Gillette of Iowa, is retiring and W. Stuart Symington of St. Louis, Mo., has been nominated to replace him, it is probable the Board's program for disposal of the pipe lines will be further delayed—possibly until the end of this year.

Rationing of Gas Stoves Discontinued as of July 31st

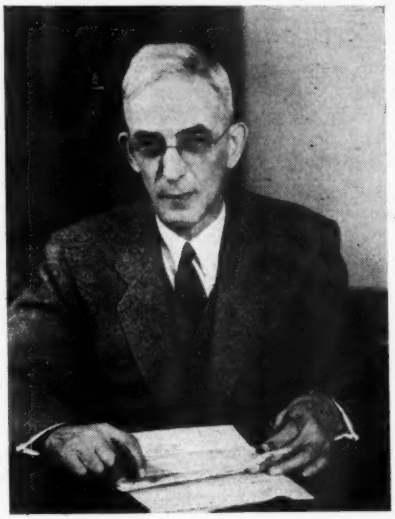
Rationing of gas cooking and gas heating stoves to consumers will end July 31, the Office of Price Administration and the War Production Board said in a joint announcement issued July 20th. Combination ranges, except oil-gas combinations, also will be sold certificate-free after that date.

Oil cooking, oil heating, combination oil-gas stoves and oil conversion burners for stoves will remain rationed.

The two agencies explained that a substantial increase in production of gas heating and cooking stoves is scheduled for this quarter. Authorized production appears great enough so that the rationing of gas stoves no longer will be necessary. The supply of fuel oil and kerosene is so short, it was explained, that unrestricted sale of oil burning stoves cannot be permitted. They will remain under the same rationing restrictions as formerly.

Gar Wood Industries Names D. M. Kagay Sales Mgr.

D. M. Kagay, who has been named sales manager of gas equipment for the heating division of Gar Wood Industries, Inc., Detroit, according to Glen A. Bassett, president. Mr. Kagay had been the Gar Wood district representative in Michigan, Ohio, and Indiana from 1934 to 1942. During the past three years he was associated with a manufacturer of precision instruments for the Army and Navy.



D. M. Kagay

Hartzell Appointed to Cities Service Post

E. K. Hartzell, for a number of years associated with various utility properties of Cities Service Company, has been named assistant to the president of the Cities Service Gas Company with headquarters in Oklahoma City.

His appointment, effective July 1, was announced by S. B. Irelan, president of the gas company.

Mr. Hartzell will direct the company's public and employee relations program and, among other duties, supervise publicity, advertising and personnel activities.

"VICTORY HOME OF THE CENTURY" AT ATLANTIC CITY

The "Victory Home of the Century", now being exhibited at the Steel Pier, Atlantic City is to show Atlantic City visitors what they can expect to find in houses built to sell for approximately $8,500. Included in this model home is a gas refrigerator, an automatic gas water heater, an automatic gas furnace and a completely automatic gas range built to "CP" specifications, equipped with time and temperature controls.

Range, gas furnace and automatic water heater are seen on the right. The Servel refrigerator is at the opposite end of the kitchen.

Three Special Welding Courses Being Conducted at Lincoln Electric

Three new, specialized courses in arc welding are announced by The Lincoln Electric Company, Cleveland, Ohio, which are designed to increase the student's knowledge of the shielded arc process as applied to specific metals and structures.

The courses consist of one two-week training period to instruct enrollees in the technique of arc welding the common steel alloys and non-ferrous metals. A second course of one week's duration is devoted to instruction in welding sheet metal in thicknesses of from 12 to 20 gauge. A third, two-week course is intended to train students in the welding of pipe in diameters of from 2 to 10 inches.

Those now enrolled in these post-graduate courses of instruction and who are already skilled in the welding of mild steel, represent a wide variety of industries throughout the country.

The courses are under the supervision and direction of Arthur Madson, veteran Lincoln instructor at the company's plant where a school for the training of men and women in the art of arc welding has been conducted uninterruptedly for nearly 30 years. Being the oldest school of its kind in continuous existence, it has trained over 25,000 people in this rapidly growing profession.

Natural Gas Statistics

The Wall Street Journal quotes some interesting natural gas statistics. There are approximately 60,000 natural gas wells in the United States and the gas is consumed in 34 of the 48 states. Consumption this year is expected to exceed 4 trillion cubic feet as against 3.8 trillion in 1944 and 2.8 trillion in 1941. Recoverable known reserves approximate 150 trillion cubic feet and new discoveries exceed the rising rate of demand.

Colorful Bulletin Describes Heating and Plumbing Appliances

Printed and illustrated in full color, a 50 page 8¼ x 7 inch bulletin, F4, describes a comprehensive line of Heating, winter Air Conditioning and Plumbing Equipment and accessories made and marketed by American Radiator & Standard Sanitary Corporation of Pittsburgh and New York.

Liberal use of colorful illustrations of interiors show appliances as installed in living and dining rooms, kitchen, bathroom, recreation room, etc. Dimension details of appliances and colors available are set forth.

This comprehensive sales help is available to gas company sales departments and to plumbing and heating contractors.

Brooklyn Union Gas Co. Has Few Servel Service Calls

Although the average age of the 152,000 gas refrigerators in Brooklyn Union territory now is about 10 years (until the war the "retirement age" for most mechanical refrigerators) and although many have been in service for far longer periods, up to 18 years, service calls have not increased.

In fact, during the recent heat wave fewer calls were received than during similar periods in the past. Even when the mercury soared to 95.2° on June 30, only 765 Servel owners—about ½ of 1% of the total—requested service of any kind, and many of these complaints could have been avoided had the owners given their refrigerators the small attention they require.

Servicemen report that too many persons still persist in using the top of the cabinet as a shelf and the space at the sides for storing paper bags and brooms. These things prevent the free circulation of air which any automatic refrigerator must have to operate efficiently.

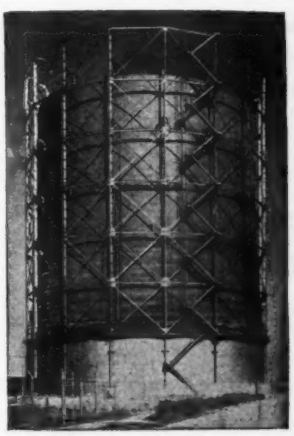
Another frequent cause of unnecessary calls for service is the failure to turn the thermostat to a lower (cooler) setting in warm weather. It is a curious thing that the woman who several times a day in winter will change the thermostat which regulates the heat in her house nevertheless completely forgets the thermostat which controls the temperature in her refrigerator.

Failure to defrost whenever the frost gets to be about ¼ inch thick on the fins of the cooling unit is still another source of trouble which could easily be avoided. The frost acts as insulation, prevents the unit from cooling the air in the refrigerator, and causes more gas to be burned as the unit struggles to overcome the handicap. Very much the same thing happens when food is placed inside the refrigerator in such a way as to prevent the free circulation of air—*Brooklyn Union Gas News*

"CP" STANDARD RANGES IN THE CANADIAN MARKET

On the right, George C. Alexander, president of Alexander & Co., leading appliance dealers of Toronto discusses with George Cross, sales promotion manager of Moffatts Ltd. the sales advantages of ranges built to "CP" standards. He points out that ranges built to these standards insure customer protection.

STACEY
SINCE 1851



94 YEARS of leadership in our service to the gas industry, and more recently serving also the Government and its armed Forces with many important installations, is a record of which we are justly proud.

The gas plant equipment we design, fabricate and erect includes

Low Pressure Gas Holders of simple and sturdy design with high quality workmanship.

High Pressure Holders, either vertical or horizontal type, riveted or welded, correct in design and detail, for storage in outlying districts, peakloads and emergency demands.

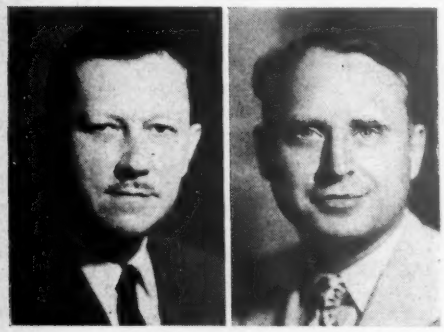
Ask us about our Gas Holder Inspection Service.

THE STACEY Manufacturing Co.

ENGINEERS
FABRICATORS
CONSTRUCTORS
Cincinnati, Ohio

Servel Announces New Sales Appointments

The appointment of H. M. Wickman as Manager of Sales, Household Refrigerator Division, Servel Inc., has been made by Geo. S. Jones, Jr., Servel's Vice President in charge of Sales.



H. M. Wickman W. K. Grube

Mr. Jones also announced that W. K. Grube has been appointed Regional Sales Manager for Region C which covers Tennessee, Georgia, Alabama, Florida, Missouri, and Kansas and parts of Kentucky, Indiana, Illinois, Oklahoma, and Mississippi.

Mr. Grube was formerly a District Sales Manager for Servel and has been Acting Regional Manager in this area during the war period.

Mr. Wickman, who joined Servel in 1935 as Sales Promotion Representative in Houston, Texas, served in World War I under General George S. Patton, Jr., who was at that time a Colonel. Previous to his association with Servel Mr. Wickman was with Holcomb & Hoke Manufacturing Company, of Indianapolis, the Deca-Disc Phonograph Company, and the Master Electric Company.

These appointments are effective as of July 1.

Mr. Jones also confirmed the appointment of J. C. Kellner as Service Manager of Servel, Household Refrigerator Division. Since the death of Mr. P. V. Wiske, Mr. Kellner has been Acting Service Manager of this division.

The other appointment announced by Servel is that of H. J. McFadden as District Manager with headquarters in Oklahoma City. Mr. McFadden succeeds Roy Weinman in that territory.

Homestead Valve Co. Makes Sales Appointments

Upon recommendation of Messrs. W. R. and F. E. Schuchman, President and General Manager respectively of Homestead Valve Manufacturing Company, Coraopolis, Pa., the Company's Board of Directors has authorized the appointment of Don H. Krey as Sales Manager, and Elliott G. Johnson as Assistant Sales Manager.

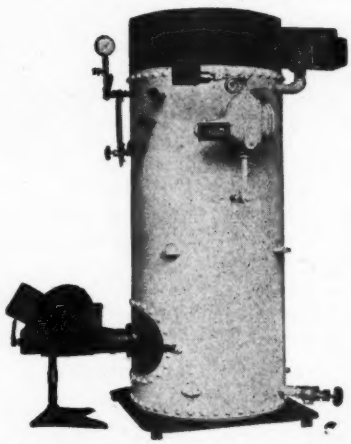
Mr. Krey will direct all phases of the Company's sales efforts including, Valves, Hypressure Jenny Steam Cleaners, and Hypressure Jenny Compound Sales and research; while Mr. Johnson will supervise all valve sales activities in addition to retaining his duties as Director of Advertising and Public Relations.

H. A. Feldbush, Engineering V.P. Worthington Pump & Machy. Corp.

Harry A. Feldbush, formerly Works Manager of the Holyoke, Mass., plant of Worthington Pump and Machinery Corporation has been named Vice President in charge of Engineering for the entire Corporation. His duties cover engineering activities of all works and domestic subsidiary companies. His headquarters will be at the general offices in Harrison, N. J.

Ralph M. Watson, formerly chief engineer of the Centrifugal Engineering Division has been appointed Assistant to Mr. Feldbush.

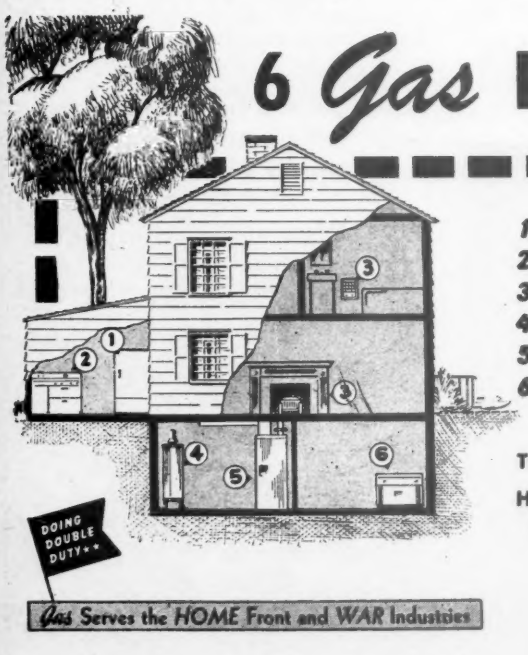
LATTNER GAS — OIL BOILER 3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency using same burner.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa

The Ohio Fuel Gas Company during July has used this excellent newspaper copy in the territory they serve. Actual size is six columns wide. It gives a most effective overall picture and statement on "Six Practical, Sound Ideas for Better Living." The reader is urged to contact his gas appliance dealer or the local Gas Company office. Attention is also directed to the radio program "News and Nutrition."



6 Gas IDEAS FOR YOUR HOME

1. Silent Gas Refrigeration
2. CP Gas Range
3. Gas Radiant Heaters
4. Automatic Gas Water Heater
5. Gas Furnace and Air Conditioner
6. Automatic Gas Clothes Dryer

TUNE IN WBNS, 12:15 P.M., WEEKDAYS
HEAR "NEWS AND NUTRITION" WITH
JIM COOPER AND BETTY NEWTON

Six practical, sound ideas for better living! . . . You're not "reaching for the moon" when you plan and save for these Gas conveniences indicated here. It's possible for you to own them, even though your budget is a modest one . . . We suggest that you talk it over with your Gas Appliance Dealer . . . or stop in The Gas Company office for more complete details.

There's a 32-page canning booklet for you in The Gas Company office. Free, of course! . . . . . .

Gas Serves the HOME Front and WAR Industries

THE OHIO FUEL Gas Company

Col. Wm. L. Plummer C.O. at Orly Writes from A.T.C.S. European Base

Colonel William L. Plummer, formerly district manager for George D. Roper Corp., entered the air services in 1942 and is now Commanding Officer at Orly, the largest A.T.S.C. European Base.

Two of his letters from Headquarters written in June to the Roper Corporation will interest many of our readers. He was present at General Eisenhower's departure for America. The letters follow along with a photo showing the writer and "General Ike."

June 8, 1945

The last two weeks have probably been the most hectic of any time since I have been overseas. We have been charged with the responsibility of getting out all the great combat leaders that you have been reading about arriving home by plane. I guess more great history makers have passed through here than at any place in the history of the world the last few weeks. We have had everyone from General Patton going home to Sonja Henie arriving. She came out to see a load of our wounded off this week and is just as delightful as she is in the movies. We have had all the ambassadors and special representatives, senators, congressmen, prominent civilians and great military leaders, so that from here on in, I don't think I would walk across the street to see Lady Godiva on a motorcycle in Park Avenue.

In addition to all of this, we have just finished our first General Annual Inspection and were given a very good report, I am glad to say. The wind up of all of these people or, I should say, the grand finale, will be in about another week when the Supreme Commander will return as has been the announcement in all the papers. He uses this as his Paris base and I have seen him and shaken hands with him on numerous occasions and he really is a great man.

Perhaps the sun glasses on Colonel Plummer blinded him for the moment so that he didn't recognize the Eisenhower smile; or is he just rounding up to confront him?

June 17, 1945

This last week has been about the most exciting that I have put in. We have had Sonja Henie in and out for the past couple of weeks and the grand finale was seeing General Eisenhower off yesterday. He is a great guy and I would only like to be in Washington upon his arrival. He left from my airport with escorting planes and it was an exciting event.

Last Monday London telephoned me to get over the following morning as early as possible. I did not know what this was about and did not come to until, at a formal staff meeting of the Commanding General, a soldier appeared with camera and flash bulbs. They pinned the Bronze Star Medal on me for work done in Cornwall over a year ago.

Dresser Industries to Acquire Security Eng'g Co.

Security Engineering Co., Inc., Whittier, Calif., will be acquired by Dresser Industries, Inc., Cleveland, Ohio according to a joint announcement by H. N. Mallon, president of Dresser and W. E. Seivers, executive vice president of Security.

The agreement has been signed by the officers of both companies but is subject to the approval of the Commissioner of Corporations of California and Security stockholders.

A manufacturer of oil field tools and specialties, Security Engineering Company, Inc., is the sole manufacturer of Securaloy, a patented metal for oilwell liners. It is also, through the purchase in 1944 of Crum-Brainard, Ltd. of California, the manufacturer of rock roller bits particularly adapted to drilling operations in difficult sub-strata. Acquisition of the company will further round out the activities of the 13 Dresser member companies now serving the petroleum and gas industries.

Tappan Promotes C. C. Wilson

Charles C. Wilson, former Michigan representative for the Tappan Stove company, has been appointed North Central Division manager, as announced by Keith B. Miller, general sales manager. The appointment was effective July 1.

Wilson will supervise the activities of Tappan representatives operating in the states of Michigan, Wisconsin, Minnesota, North and South Dakota and in the city of Chicago.

• BARBER
Gas Pressure
REGULATORS
for Reliability!
Certified by A. G. A. Testing Laboratory. Write for Catalog and prices on Barber Conversion Burners, Appliance Burners, and Regulators.

THE BARBER GAS BURNER CO.
3702-4 Superior Avenue
CLEVELAND OHIO
Sizes ¼" up

GPM
IRON HYDROXIDE
The mark of
unerring dependability
in purification
GAS PURIFYING MATERIALS CO., INC.
3-15 26th Ave.
Long Island City 2, New York

Gas Range Shipments By Air

As a test of the practicability of shipping durable goods in full carload lots by airfreight, Cribben and Sexton Company of Chicago, manufacturers of Universal gas ranges, sent a cargo of more than nine tons of gas ranges from the Chicago factory to their dealers in Los Angeles.

Many records were established in a 2000 mile flight which took only ten and one-half hours. It was the largest cargo of durable goods ever to be flown across country; the first full load of gas ranges ever to go by air; the first heavy shipment ever made in the largest freight plane ever built; and the first full load of appliances to be delivered in California the same day they were manufactured in Chicago. It was the first airfreight shipment by contract carrier.

Cribben & Sexton Co. handlers are loading gas ranges from truck into giant air freight.

That airfreight might be the answer to some of the problems of the home appliance industry was apparent from the success of the flight. For example, officials of Cribben and Sexton stated that most rail and water freight shipments have arrived in damaged condition, sometimes as many as 50 percent of the ranges needing either new parts or complete replacement, while this entire cargo arrived without a scratch or chippage.

The air shipment was packed in the plane in a novel manner. On the bottom of the cargo hold a layer of 30 crated ranges was bolted to the floor. Atop the crates and bolted to them was another full layer of 25 uncrated ranges. Although enroute the ship ran into two severe storms which the crew reported "gave the ship a terrific beating," it was found on landing that not a single range had been damaged.

John E. Bogan, general sales manager of Cribben and Sexton Company, called attention to another potential advantage.

"Dealers have a very large backlog of orders now in their files," he said. "Most of the people who are waiting for ranges have been waiting for a good long time. It is apparent that every range we make for the next few years will be needed at once. For that reason we want speedy delivery. We shall make as many ranges as we can as fast as we can and we don't like to think that all the speed and pressure we put on our production line will be wasted by the ranges sitting on freight platforms and in slow box cars for a two or three week period.

"We seriously anticipate the transition of molten metal into ranges, the assembly, delivery and installation for use any place in the United States within 24 hours—literally going from the steel ladle to the gravy on the roast in the oven in a day or less. This flight represents but one of the many helpful techniques of modern business to come out of this war."

The safety of the shipment and assurance of its proper delivery was stressed by Charles Kimball, the company's sales promotion manager, who cited the insurance cost of the load of 55 ranges as an indication of what the insurance underwriters thought of airfreight.

"We took complete coverage on the shipment and, because it was a test, were prepared to pay a large premium," he said. "When we got the bill it was for the minimum premium, $10—less than 20 cents per range."

A large delegation of mid-west business men saw the flight take off. The crowd included officials of the city and state, civic leaders, customers of the company, public service officials and even some business competitors of the shipping company. A similar crowd waited the arrival on the west coast.

A. F. Davis Welding Library

To assemble in one place all the important literature on welding—this is the objective of the A. F. Davis Welding Library at the Ohio State University, Columbus, O.

Established in 1942, the Library already includes one of the most extensive collections on welding in the world. On its shelves are more than one thousand books, including volumes on metallurgy, designing for welded construction, welding techniques and procedures, properties of weld metals, standard welding handbooks, welding magazines, the original award studies of The James F. Lincoln Arc Welding Foundation, patents relating to welding, and many other subjects.

The Library is named for its donor, Mr. A. F. Davis, vice president and secretary of the Lincoln Electric Company, Cleveland, Ohio. Mr. Davis has spent over 30 years in the welding industry. During this time he has seen welding processes develop from little more than laboratory experiments into a large industry.

The A. F. Davis Welding Library invites the assistance of the industry in extending its collection.

In accordance with the donor's wish that the Library contain every important book, manuscript, article or document relating to welding, engineers doing original research are invited to send their papers to the Library for permanent filing and for use by industry in future years.

Copies of over ten thousand patents concerning welding equipment and the patented applications of welding to products or structures are now on file, offering one of the most extensive reference collections available in the Middle West from which patent researchers may obtain information. It is desired to make this collection of patents the most complete one in the world. To accomplish this end, friends of the Library are urged to send to the Librarian the patent number of any patents pertaining to welding, welded equipment, welded machine design, welded structural design or any welding application.

Rejoins Reliance Regulator Corp.

Mr. J. E. Gesner recently rejoined Reliance Regulator Corporation, division of American Meter Company, as engineer.

His experience makes him especially well fitted for serving the manufactured and natural gas, LP-gas and petroleum industries. It includes fifteen years with the Pacific Gas and Electric Company, where he started in the East Bay Division, from which he was advanced to the Colgate Division as Measurement Inspector. He later became Industrial Gas Engineer of the General Sales Department.

J. E. Gesner

Mr. Gesner's scholastic background includes Polytechnic College of Engineering, Oakland, California, and the University of California.

L P Gas For Oshkosh and Green Bay, Wis.

The Wisconsin Public Service Corp. has filed an application with the Public Service Commission to install liquefied petroleum plants in Oshkosh and Green Bay, to cost $17,000 and $18,130, respectively. The added facilities are needed to boost gas production at times of heavy demand.

W. R. McLaughlin Heads Gas Products Division, Pittsburgh Equitable Meter Co.

A. J. Kerr, General Sales Manager of Pittsburgh Equitable Meter Company, has announced the appointment of W. R. McLaughlin as Sales Manager for the Gas Products Division. In his new position Mr. McLaughlin will direct the sales for Emco meters, regulators, and allied equipment for measurement and control.

Mr. McLaughlin has spent his entire business career in the gas and oil industry, having been associated with the Arkansas Natural Gas Company for a period from 1919 through 1934 when he joined the Pittsburgh concern as a sales engineer. In this capacity he contacted a majority of the operating personnel in both gas and oil companies located in the six Southwestern states.

W. R. McLaughlin

A. G. Kirker

While connected with the Arkansas Natural Gas Company his work was largely devoted to gas distribution, pipe line, and transmission activities which involved measurement and regulation. In 1928 he was made superintendent of the Gas Measurement Division for this utility.

Mr. McLaughlin is well-known for his work in furthering the interests of the Southwestern Gas Measurement Short Course. He has served on numerous committees throughout the 22-year tenure of this school and was general chairman in 1934.

He was one of a committee of eight selected from industry to assist the faculty of the Texas College of Arts and Industries, Kingsville, Texas, in establishing a course in natural gas engineering. For this participation he was awarded an Honorary Degree in natural gas engineering by the college in 1938.

A. G. Kirker Joins Boston Office, Pittsburgh Equitable Meter Co.

Announcement has been made by A. J. Kerr, General Sales Manager of Pittsburgh Equitable Meter Company-Merco Nordstrom Valve Company, of the appointment of A. G. Kirker to the position of Service Engineer in the firm's Boston District Office to operate under the jurisdiction of F. C. Arens, District Manager. Mr. Kirker will handle the sale and service of both Pemco-Merco products in the State of Connecticut and sections of Rhode Island.

Mr. Kirker is a native of Connecticut. He has had many years of practical water works experience in addition to a diversified knowledge of the gas meter, regulator and valve problems of utilities and industry.

Philadelphia Gas Works Adopts Liberal Sales Policy for Benefit of Dealers

MERCHANDISING PRINCIPLES:

1. Approved Types of Appliances

Gas appliances offered for sale shall be such as to assure safe, efficient, and dependable service. Gas appliances approved by the American Gas Association Testing Laboratories shall be deemed safe, efficient, and dependable

In order to obtain greater customer acceptance of appliances of superior quality, the PGW Appliance Laboratory tests and approves appliances of higher performance and efficiency for installation in Philadelphia. All appliances so approved are available to Philadelphia retailers for sale.

2. Merchandise To Be Sold By Utility

The utility shall sell only gas-consuming appliances and the auxiliary equipment necessary for their complete installation and use.

PGW subscribes wholeheartedly to this policy. For example, PGW will actively promote kitchen modernization through the New Freedom Gas Kitchen program, and will look to Philadelphia retailers to sell all supplementary equipment, including such merchandise as kitchen cabinets and floor coverings, as well as the gas appliances.

3. Retail Price of Appliances

The established list price or a price that allows the customary mark-up shall be recognized as the proper maximum retail price of any appliance.

When the utility purchases an item with the intent of establishing a special price thereon, the utility shall provide that such item may be purchased by any merchandising outlets in the territory served by the utility from the merchandising outlet's supplier at its customary discount (applied to such special price), subject to the supplier's usual credit, franchise, sales, and other conditions applying to the regular sale of that item.

The foregoing is not intended to apply to shop-worn, damaged, repossessed or reconditioned items, nor to articles previously purchased which have become obsolete.

PGW will continue to sell appliances at a price level that will permit Philadelphia retailers to make a normal profit on such appliances.

4. Exclusive Sale of Any Appliance

The utility shall not accept the sale of any make or model of appliance to the exclusion of other dealers.

PGW will continue to require that any appliances sold by it must also be made available to Philadelphia retailers through normal trade channels.

5. Selling Conditions

No premiums shall be given, nor trade-in allowance made by a utility in connection with the sale of any appliance, unless all retailers selling that same appliance are enabled to participate.

It is recognized that Regulation "W" governs the length of installment terms and down payments. Should Regulation "W" be rescinded, the length of installment terms, down payments, and carrying charges shall be economically sound and within the financing terms available to other dealers.

PGW will insist that any special selling arrangements made for it on gas appliances are fully available to Philadelphia retailers.

PUBLIC—RETAILER—UTILITY

All profit by the wide use of better Gas Appliances

6. Selling Personnel

The activities of all appliance salesmen should be controlled so as to avoid misrepresentation and other unfair selling practices.

Total compensation of utility appliance salesmen shall, so far as possible, be competitive with that of compensation paid by retailers.

PGW will be fair and equitable in its selection, supervision, and compensation of salesmen.

7. Advertising

Coordinated advertising should be developed by the Utility with other dealers with the view of making available to such dealers all reasonable cooperation in advertising, displays, and sales promotion.

It will be the policy of PGW to advertise gas as the most desirable fuel for the Big Jobs of the home, and thereby widen the public acceptance of all gas consuming appliances, providing retailers with the opportunity for the profitable sale of such appliances. Reasonable cooperation in displays, advertising, and promotion with retailers will be part of this program.

8. Installation

If a utility contributes to the cost of piping facilities necessary for the installation of appliances sold by itself, it shall make identical contributions on similar appliances of approved quality sold by retailers in the same territory.

PGW will continue to include in the retail price of all appliances a reasonable cost for delivery and connection. In the interest of fair competition, PGW will encourage all retailers to provide this charge in their selling prices, so that the customer is sold the appliance "ready to use" in his home.

9. Servicing

In servicing an appliance beyond the warranty period, no distinction shall be made in the service rendered and in the policy of charging, regardless from whom the appliance was purchased.

PGW for almost fifty years has serviced approved appliances on its lines, regardless from whom they had been purchased. This liberal and fair policy has been one of the principal reasons for retailers' enthusiasm for the sale of gas appliances.

The July issue of *Appliance Merchandiser* published in the interest of Philadelphia Dealers by The Philadelphia Gas Works Company makes this announcement.

The Philadelphia Gas Works Company endorses the Merchandising Objectives and Principles, suggested by the Pennsylvania Gas Association. PGW will not only adopt these principles wholeheartedly, but also will expand on many features of this program in the extension of its cooperation to all Philadelphia retail outlets selling gas appliances.

Many customers had placed orders for gas heating equipment and were unable to obtain it in time to be included in this year's installation program. In order to give these customers assurance of a definite place in next year's installation schedule, PGW has planned an interim program. All Dealers can recontact those customers who have placed orders with them to obtain the customer's agreement to accept delivery of the equipment as soon as it becomes available, with the assurance of installation beginning after March 1, 1946.

Obituary

THORNTON LEWIS

Thornton Lewis, past president of the American Society of Heating and Ventilating Engineers died suddenly on July 4, at the age of 58, at his home in Newtown, Penna.

Until recently Mr. Lewis had served as Chief of the Public Service Branch of the Army Service Forces, Washington, D. C., and previously he spent two years as Deputy Chief of the Procurement Service Branch, U. S. Army Ordnance Department.

Mr. Lewis joined the A.S.H.V.E. in 1919 and did outstanding work as Chairman of the Committee on Research, as a Council Member and as head of the Executive and Finance Committees. In 1929 he became President of the Society and during his many years of active service, he was identified with the establishment of the Society's endowment fund, the adoption of a number of its codes.

J. P. HAFTENKAMP

Joseph P. Haftenkamp, operating vice-president of Rochester Gas and Electric Corporation of Rochester, N. Y., died on June 27th, aged 64 years. He had been associated with the Rochester utility for 40 years, joining the staff shortly after his graduation as a chemical engineer from Michigan State College. In 1907 Mr. Haftenkamp became assistant superintendent of the company's gas plants and in 1919 was promoted to superintendent. In 1927 he became assistant general manager of the company and in 1934 was made vice-president in charge of operations. Although nationally famous as a "gas man" Mr. Haftenkamp was one of the organizers of the Electric Association of Rochester, composed of local appliance dealers, and served as president. He was also prominent in the affairs of the Empire State Gas and Electric Association and filled important committee posts with various national associations.

J. W. BATTEN

John W. Batten, president of the Michigan Consolidated Gas Co., died July 1, in the Henry Ford Hospital, Detroit, Michigan, at the age of 65.

Mr. Batten came to Detroit to work for the Detroit City Gas Co., predecessor of the Michigan Consolidated Gas Co. He started as an assistant in the laboratory.

Promotions included: chief chemist, plant superintendent, superintendent of production, superintendent of distribution, engineer, assistant general manager and vice president and general manager.

He became president of the company, Feb. 18, 1944, succeeding William G. Woolfolk, who was made chairman of the company.

He was a member of the executive board of the American Gas Association and of the boards of directors in the Detroit Rotary Club and the Industrial Safety Council; a member of the Detroit Engineering Society and the Michigan Gas Association.

JOHN J. KIRKPATRICK

John J. Kirkpatrick, manager of the Holyoke, Mass., Gas and Electric Dept. for 32 years, died June 25, following an illness of two months. He was 78 years of age.

Born in South Hadley Falls, Mass., Mr. Kirkpatrick attended schools there, studying further in Canada at Ottawa College and McGill University. Following a period of private engineering practice, he served as city engineer in Holyoke and subsequently as superintendent of water works. He was appointed head of the gas and electric department for the city of Holyoke in 1913.

The Aluminum House

The first aluminum house, designed by the Aircraft Industries Research Organization on Housing (AIROH), a brief description of which was given in the "JOURNAL" of April 18 (page 499) was opened for public exhibition by Mr. Duncan Sandys, Minister of Works, in Somerset Street, at the rear of Selfridges, on June 5. The aluminum house is one of seven types of temporary houses to be supplied to local authorities under the Housing (Temporary Accommodation) Act, 1944. The houses will be provided and owned by the Government, and the local authorities will choose the tenants, fix and receive the rent, manage the houses, and keep them in repair.

An order for 50,000 aluminum houses has been placed by the Ministry of Works, the Ministry of Aircraft Production acting as agents for production. The order is being treated on lines similar to the manufacture of aircraft, and production commenced at five centers (four in England and one in Scotland). Production began on a small scale in June, and will eventually build up to a peak production of 5,000 houses a month.

The exhibition house, which is fully furnished, has a floor area of 662 sq. ft., and comprises a living room with a glass panel through which a mother can keep a watchful eye on her children, two bedrooms, hall (with space for a perambulator), bathroom, and kitchen, with refrigerator and boiler. Most of the 50,000 houses will be equipped with a standard gas kitchen unit, though the one on view has an electrical unit, and water can be heated either from the kitchen unit or from the fire in the living room.

The house is completely prefabricated in four separate units, each unit being assembled in the factory, where all the fitments are installed and final decorations are carried out. The speed with which it can be erected is illustrated by the fact that the exhibition house was completely erected in eight hours.

In opening the house, Mr. Sandys said it had been perfected after two years' research on the part of the aircraft industry in consultation with housing experts, with the two-fold object of helping to meet the acute housing shortage and of turning the highly organized aircraft industry over to useful peacetime production. In olden times they spoke of beating swords into ploughshares; today they were beating bombers into bungalows.—*Gas Journal, London.*

Book Review

Piping Handbook, Fourth Edition, 1945, by Sabin Crocker, M. E., Senior Engineer, Engineering Division, Detroit Edison Co. Published by McGraw-Hill Book Company, 330 W. 42nd St., New York 18, N. Y. Size 5 x 7¼ in. 1376 pages, price $7.00.

This Handbook makes available to the engineer, designer, and contractor a vast compilation of data necessary to the effective use of piping in all its engineering and industrial applications—steam and power plant piping, heating and plumbing systems, oil and gas piping—everything from water distribution to hydraulic systems for airplanes. The book authoritatively covers scientific fundamentals, materials, and design and installation practice, and gives many useful and dependable construction details, cost analyses, dimensional standards, material specifications, definitions, charts, formulas, etc.

In this edition, the scope of the Handbook has been extended to include chapters on gas piping, refrigeration piping, hydraulic power transmission piping, corrosion and protective coatings. Other chapters have been considerably augmented. Codes in earlier editions have been revised to date. Some forty collaborators contributed to this comprehensive handbook which also is thoroughly indexed as to contents.

The Reliable Shut-Off for Street Mains

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds. Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

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Lambert Meter Co. Receives Army-Navy Award

Mr. D. N. Lambert, President, The Lambert Meter Company, Plainfield, N. J., has been notified by the Assistant Secretary of the Navy that the Army and Navy has granted its plant the Army-Navy "E" award for outstanding production of war materials.

In July 1942, the Lambert Meter Company was given its first job to make a few *"Radar"* components. This job was for the Office of Scientific Research and Development. Because of the excellence of the quality of its work and the speed of its performance, the character and quantity of this work extended rapidly to relatively large proportions, so much so, that all of its existing machinery and the nature of its manpower skills had to be radically converted to new and different standards.

The nature of the war work involved extremely complicated, close tolerance precision instrument units of many types and highly varied character. Usually, after a developmental piece of work was completed here, and the design approved, it was adopted for production purposes.

In the very near future a presentation ceremony will be held and an announcement of this event will follow at a later date.

Export Corporation Formed

Colonel W. F. Rockwell, President of Pittsburgh Equitable Meter Company, Pittsburgh, Pa., has announced the formation of the Pittsburgh International Corporation, with offices at 7701 Empire State Building, New York City. This firm will handle the export sale and distribution of products manufactured by Pittsburgh Equitable Meter Company-Merco Nordstrom Valve Company, and subsidiaries.

The Pittsburgh International Corporation will be under the direction of A. L. Di Giulian, Vice President. Mr. Di Giulian has had extensive experience in foreign markets. He was educated in Europe, completing studies in Italy, Spain and Portugal. He was graduated from Georgetown University, School of Foreign Service, in 1927, and has since been honored by the University with a special certificate for his accomplishments in foreign service and with the Coutinho medal for his work in the Portuguese language. Mr. Di Giulian, who is an accomplished linguist, has spent many years in U. S. Government service. His immediate connection prior to accepting his new post was Chief, Foreign Communications Section, Office of Exports, Foreign Economic Administration, Washington, D. C.

Mr. Di Giulian will be assisted in the operation of the export firm by George E. Doty. Mr. Doty, after attending Carnegie Institute of Technology, joined the Pittsburgh Equitable Meter Company in 1926. His experience embraces all phases of manufacture and sale of the company's products. Prior to war he served as Export Manager. More recently Mr. Doty was assigned to the Merco Nordstrom Valve Division at the Oakland, California plant, as assistant to the General Manager.

The New York offices of the Pittsburgh International Corporation will be opened September 1, 1945.

POSITION OPEN

Gas Engineer or Technician

Large Oil Co., in Metropolitan New York Area has an opening for experienced man for contact work, in both manufactured and L.P. Gas Field. College education and plant or laboratory background preferred. Postwar opportunities.

In replying state experience, education, draft status, salary expected. Enclose inexpensive photograph. Address box #142, c/o AMERICAN GAS JOURNAL, 53 Park Place, New York City 7, N. Y.

POSITION WANTED

Practical Gas Meter Shop Repairman Foreman, desires position where needed. Can furnish the best of reference. Address replies Box 143 c/o AMERICAN GAS JOURNAL, Inc., 53 Park Place, New York City.

L P Gas

(Continued from page 34)

ances should be attempted until the section is thoroughly purged. As the work progresses call backs will be received due to pockets of the old gas remaining in the lines and at least one man should be kept available for these calls. While these calls may be annoying, they will not be serious. As the first section is converted, a few days should elapse before starting the next section so as to get all call back adjustments taken care of and everything in order.

6. Final Section: Under the sectional system of converting you will finish all sections and have left only that section around the manufactured gas plant. This final section should be arranged so as to have used most of the old gas at the time of conversion. As this last section has been converted all holders should be emptied and thoroughly purged with steam to remove an explosive hazard. All larger underground lines could be flooded with water as a safety precaution. Disposition of plant equipment will be decided according to local conditions.

Finally

To those who have never worked with liquefied petroleum, and especially undiluted propane, you will have a most pleasant surprise after the conversion is completed and the few problems overcome and you can appreciate real liquefied petroleum gas service. The uniformity and cleanness of the gas will add much to improve your customer relations and public acceptance of Gas The Modern Fuel.

WPB Time Schedule on Appliances

By next spring according to WPB reckoning, the production of consumer durable —or metal—goods could be going on at an over-all rate of at least 30 percent higher than in the peacetime year of 1939. This does not mean, however, that all items will be coming on the market at that rate.

To make sure that rock-bottom needs are met for some of the more complicated goods, the government is scheduling definite amounts of them and giving their makers priorities to get materials.

Scheduled for output during the last six months of the year are: between 600,000 and 700,000 gas ranges, 530,000 mechanical refrigerators, 700,000 washing machines, 70,000 domestic electric ranges, 200,000 passenger automobiles and 400,000 trucks.

Natural Gas Committee Selected to Participate in F. P. C. Hearings Sept. 18th

Announcement of the names of the industry members who will serve on a Steering Committee and those who will head the various subcommittees appointed to prepare the natural gas industry's case during the Federal Power Commission Investigation hearings, scheduled to start September 18, was made July 21st.

The Steering Committee and the subcommittees will use the services of E. Holley Poe and Associates, nationally known natural gas engineers, as well as other consultants and personnel from the industry in coordinating the material to be presented.

Members of the Steering Committee are:

E. Buddrus, Panhandle Eastern Pipeline Co., Chicago; D. D. Harrington, Hagy, Harrington and Marsh, Amarillo; Paul Kayser, Gulf States Oil Company, Houston; Joseph Bowes, Oklahoma Natural Gas Co., Tulsa; William H. Wildes, Republic Natural Gas Co., Dallas; Walter Beckjord, Columbia Gas and Electric Co., New York; J. F. Robinson, East Ohio Gas Co., Cleveland; R. W. Hendee, Colorado-Interstate Gas Co., Colorado Springs; William Moeller, Southern California Gas Co., Los Angeles; B. R. Bay, Northern Natural Gas Co., Omaha; F. S. Kelly, Arkansas Natural Gas Co., Shreveport; N. C. McGowen, United Gas Pipe Line Co., Shreveport; John A. Ferguson, Independent Natural Gas Association of America, Washington, D. C.; S. B. Irelan, Cities Service Gas Co., Oklahoma City; Rex Baker, Humble Oil and Refining Co., Houston; Don Emory, Phillips Petroleum Co., Bartlesville; E. V. Kesinger, Natural Gas Pipeline Co., Chicago; R. H. Hargrove, United Gas Pipeline Co., Shreveport; Richard Alden, Phillips Petroleum Co., Bartlesville; E. L. Rawlins, United Gas Pipeline Co., Shreveport.

Chairmen of the subcommittees are:

On Gas Reserves: W. H. Wildes.

On State Commissions and Public Interest: D. A. Hulcy, Lone Star Gas Co., Dallas.

On Interstate Natural Gas Pipeline Economics: E. V. Kesinger.

On Natural Gas Utilization, End Use and Competitive Fuels: R. H. Hargrove.

On Chemical Use of Natural Gas: Richard Alden.

On Natural Gas Production and Gathering: E. L. Rawlins.

F. C. Packer of Payne Furnace on Advertising Copy Comm.

F. C. Packer, General Manager, Payne Furnace & Supply Co., Beverly Hills, Calif., has been appointed a member of the national advertising Copy Committee of the American Gas Association. Mr. Packer was nominated for the office by the Executive Committee of the Manufacturers Section of the Pacific Coast Gas Association.

Three other representatives of manufacturers are members of the Copy Committee, namely, R. J. Caniff, Advertising & Sales Promotion Manager, Servel Inc., Evansville, Ind., Jim Donnelly, Sales Manager, Gas Water Heater Division, A. O. Smith Corporation, Milwaukee, Wisc., and L. C. Ginn, Sales Promotion Manager, American Stove Company, Cleveland, Ohio.

In addition to their representation on the Copy Committee, the manufacturers through the A.G.A.E.M., have two representatives on the Committee on National Advertising. They are Lyle C. Harvey, President of the A.G.A.E.M., and Stanley E. Little, Chairman of the A.G.A.E.M. Advertising Committee.

Williams Oil-O-Matic Merges With Vacuum Cleaner Co.

Merging of the Williams Oil-O-Matic Heating Corporation and Eureka Vacuum Cleaner Company was approved by the shareholders of both companies on May 28th. Both divisions are well underway with far-reaching postwar plans.

Both Oil-O-Matic and Eureka will continue with entirely separate, completely independent sales and merchandising set-ups. Product trademarks, too, will be carried as before. The Williams Oil-O-Matic Heating Corporation is now known as the Williams Oil-O-Matic Division of the Eureka Vacuum Cleaner Company.

W. A. Matheson, president of the Williams Oil-O-Matic Heating Corporation now becomes a vice president and director of the Eureka Company and manager of the Williams Oil-O-Matic Division. Henry W. Burritt, Eureka president since 1939, becomes president of the merged companies.

"While sales activities of both divisions will be completely independent," said Mr. Matheson, "the merchandising and marketing experience of one is bound to help the other in an exchange of ideas. Above all, the wartime experience of both organizations will bring new and greater significance to the postwar products which will bear the Eureka or Oil-O-Matic trademark."

American Meter Co. Receives Second "E" Award

American Meter Company's Philadelphia plants were notified recently that they had won a second war production award, entitling them to display the white star on their Army-Navy "E" flag.

Illinois Inst. of Technology

Dr. Henry T. Heald, president of Illinois Institute of Technology announces the establishment of a "Training Within Industry" program designed to service industries in meeting their post-war needs for capable engineers and supervisors. Professor A. G. Giles, of the Institute's Department of Technical Drawing, has been appointed co-ordinator of extension courses.

CURVES with straight pipe Save Time on the job

Many Field Bends and "Specials" Eliminated with Dressers

Because Dresser Couplings permit approximately 4 degrees of deflection from pipe section to pipe section (from 10° for small diameter pipe to ½° for very large diameter pipe), it is possible to build moderate curves in a pipeline without resorting to pipe bending in the field.

Obstacles such as rock strata, buildings, poles and ground elevations need not delay pipeline construction. Special surveys, to avoid trouble at these points, are unnecessary.

None of the other Dresser advantages are sacrificed in building a curve in this manner. Dresser Couplings can be installed with the same speed, and assurance of no leakage, that is possible with straight-line building. No skilled workmen are required for any Dresser Coupling installation.

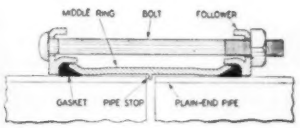
From 65 years of experience with all types of pipelines, Dresser has accumulated one of the most complete sets of pipeline data in the world . . . to help you build pipelines. Send us your inquiry on any pipe joining problem.

★ ★ ★

DRESSER MANUFACTURING DIVISION
Bradford, Pennsylvania
In Texas: 1121 Rothwell St., Sec. 16, Houston, Texas.
In Canada: Dresser Manufacturing Co., Ltd., 60 Front Street, West, Toronto, Ontario.

DRESSER COUPLINGS for maximum joint flexibility

Style 38



Cross Section

Dresser Couplings are simply installed . . . and easily salvaged for new lines. Two resilient gaskets held in compression, grip pipe tightly . . . but also permit considerable latitude in pipe deflection to permit building curved pipelines. This flexibility also permits expansion and contraction of pipe sections without setting up harmful stresses . . . the key to the decades of service with practically no maintenance so characteristic of Dresser-coupled pipelines.

DRESSER COUPLINGS

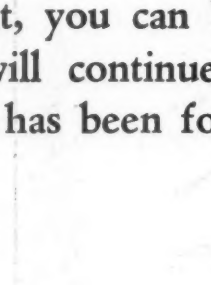
ONE OF THE DRESSER INDUSTRIES

for Plain-End Pipe

Watch for New Developments from Sprague

A great many improvements in all fields of endeavor will evolve from scientific advancements made in this war.

New chemicals, new metals, better plastics, synthetics and electronics will find application in civilian goods. It staggers the imagination to visualize what the future may hold.

In any event, you can be assured that SPRAGUE will continue to be in the forefront as it has been for the past forty years.

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